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WALTER S. LACHER, *Managing Editor*. JOHN G. LITTLE, *Associate Editor*.

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## CONTENTS

EDITORIALS .....	323
LETTERS TO THE EDITOR.....	325
LARGE WAGE INCREASE FOR MAINTENANCE MEN.....	326
A NEW FOUR-CYCLE MOTOR CAR ENGINE.....	327
NOT ENTIRELY ACCORDING TO RULE G; M. O. WAY.....	328
CONCRETE WATER TANKS FOR RAILROAD USE.....	331
OCTOBER MAINTENANCE CONVENTIONS.....	332
WATER WASTE AND FUEL CONSERVATION; C. R. KNOWLES..	333
BUREAU OF STANDARD'S TESTS OF STUCCO; J. C. PEARSON...	334
A NEW PORTABLE DERAIL.....	336
LIGHT RAILWAYS BEHIND THE FRONT.....	336
A MALLEABLE IRON FLANGWAY GUARD.....	337
THE ROADMASTERS' ANNUAL CONVENTION.....	339
RECLAMATION OF TRACK MATERIALS	
COMMON DEFECTS IN RAILS	
FENCES, CATTLE GUARDS AND FARM CROSSINGS	
THE TRACK LABOR SITUATION	
LABOR SAVING DEVICES	
METHODS OF PURCHASING AND INSPECTING TIES	
BEST METHODS OF RAISING TRACK	
ACTIVITIES OF THE RAILROAD ADMINISTRATION.....	353
GENERAL NEWS .....	355

The economy of saving cement sacks so that they may be returned to the manufacturer for refund is so thoroughly understood and offers so little opportunity for argument that it has become a decidedly trite subject for a discussion of any kind. However, the subject is given renewed interest by the fact that, effective September 1, the manufacturers' charge for each sack will be 25 cents instead of 10 cents, the result of the unprecedented price of cotton. With four empty cement sacks representing the value of one dollar, surely there is no excuse for practices tending toward their loss or destruction. The opening of sacks with a sharp shovel blade or their use as overshoes, aprons or door mats by the workmen or as protection against weather for the concrete work should become as unpopular a pastime as the lighting of cigars with dollar bills.

When one road has been able to reduce its bills for water service from outside companies (about 20 per cent of its total consumption) by \$34,000 annually, the possibilities of reducing the waste of water would seem to warrant careful consideration. When it is further estimated that this waste, if common to all the railways of the United States, leads to an unnecessary consumption of 2,300,000 tons of coal annually at a time when there is not a sufficient quantity for essential requirements, there would appear to be ample incentive for an active campaign to eliminate the waste of water which is now so common on railways. A prominent federal officer issued an appeal to householders recently, urging them to eliminate the waste

of hot water as a fuel conservation measure. This is well as far as it goes, but coal is also required to pump water, and, as shown in an article on another page, every  $\frac{3}{8}$ -in. faucet allowed to run at the average pressure found in railway plants, results in a waste of seven tons of coal per month. Failure to realize that water is not "as free as air" and that it requires fuel and costs money to provide it at the faucet has been largely responsible for this waste and has led to negligence in repairing leaks as they develop. With the added necessity of conserving fuel at the present time one can perform a patriotic service as well as effect an important economy for his road by eliminating all wastes of this character.

No better indication of the value of the maintenance of way associations in this period of unusual stress to the men in this branch of railway service and to the roads which employ them can be gained than by an inspection of the program for this year's convention of the Roadmasters' Association. Carefully prepared reports on the reclamation of track materials and on labor-saving devices deal with the most vital problem confronting track men to-day—that of securing the most efficient use of such materials and men as are to be had. Likewise one needs only to call attention to the individual papers on such topics as Common Defects in Rails and Means of Detecting Them in Track; What the Government Is Trying to Do for the Railway Track Labor Situation, and Methods of Producing and Inspecting Ties and the Outlook for an Adequate Tie Supply. These show the value of attendance at such a meeting by any roadmaster or higher maintenance of way officer. This program is

typical of those which will be presented at the conventions of the other maintenance of way associations. Important as it is that every railway officer spend the maximum amount of time on his work at present we believe that he cannot devote two or three days to any better advantage than in attending a meeting such as the Roadmasters' Convention and participating in the discussion of the problems presented for consideration. As R. H. Aishton, director of the Northwestern Region, stated recently in a letter to Carl Gray, director of the Division of Operation, attendance at such a meeting will "put into these men a lot of enthusiasm for their work which cannot but result in a great deal of benefit."

#### A NEW WAGE INCREASE

**T**HE RETENTION of an adequate force of men in the maintenance of way department is dependent very largely on the rate of wages paid, and the rates paid by the roads, particularly in the track department, have been lower than in almost any other important industry. As a result there has been little or no selection of men and in periods of general industrial activity, the roads have been unable to compete successfully for their fair share of the labor. This condition has been growing steadily worse this season, not only with respect to laborers, but with foremen as well. Wages paid in the munition plants and other industries directly engaged in war work as well as in commercial plants have risen so rapidly that the general increase which all railway employees received in May had little or no effect in arresting the migration from the railways to those plants.

Shortly after the presentation of the report of the Railway Wage Commission last May the Board of Railway Wages and Working Conditions was created under the Railroad Administration to consider further increases which might be necessary in certain localities or branches of service. The conditions in the maintenance of way department were early brought to the attention of this board, which, after careful study, has recommended certain important increases that will go a long way towards bringing relief to this department. In brief, as outlined in another column in this issue, the order provides for an increase of \$25 per month for all foremen, with a minimum monthly wage of \$100 for track foremen and \$115 for bridge and building foremen; an increase of 13 cents per hour with a minimum of 43 cents per hour for carpenters and other skilled mechanics, and an increase of 12 cents per hour for track and other laborers with a minimum of 28 cents and a maximum of 40 cents per hour. All of these increases are effective September 1.

At best, the maintenance of the railway tracks and structures is difficult under present conditions. Rails, ties and other materials are available only in limited quantities; the tracks are, therefore, deteriorating and as the ties and rails become poorer more labor will be required to maintain the tracks in proper condition for traffic. While this increased wage rate will not remove all labor difficulties it will be of much assistance in improving conditions, particularly in those areas more or less remote from industrial activities. Only a short time remains in which to get the tracks into condition for winter. With the certainty of the continuance of heavy traffic, the maintenance of way department cannot afford to lose any time. It is highly important that every officer in this branch of the service take advantage of this increase in wages to recruit his forces as fully as possible and to concentrate on that work most essential to getting the tracks into condition before cold weather.

#### THE MEASURE OF RESULTS

**W**ITH THE APPROACH of the season for the annual track inspections, coming as it does after a year of most trying struggles with heavy traffic and inadequate supplies of both labor and materials, there is naturally some speculation as to what modifications should be made in the criteria upon which the awards are based. With many foremen struggling to keep their sections in passable condition without a single man to help them, they cannot be expected to make a presentable showing in competition with their more fortunate neighbors. And while ballast and grass lines along the road, neatly trimmed lawns about stations and carefully raked grounds about tool houses and yards are of considerable importance in normal times, they are of minor consideration under present circumstances.

During times of mild labor shortages a foreman may be held very largely responsible for the maintenance of his full allotted force, but under present circumstances it would be entirely unfair to do so. Obviously some allowance must be made for the size of the gang provided to do the work. But with a force totally inadequate the most important problem is to determine which items of the work are of least importance, in order that they may be neglected in favor of more essential work. Appearances are obviously of minor importance and even riding qualities of the track are of less consideration than normally. What, then, is the criterion by which that work may be judged? It is impossible to apply the standards of maintenance ordinarily applied to tracks of less importance, since the traffic will be heavier than ever and ability to carry the traffic is the one important consideration. Completion of the work assigned for the season, such as the current renewals, is another measure of essential work, while the condition of the line to meet the coming winter is also important. As to specific items of a section foreman's duties there is an opportunity for a large difference of opinion and these questions constitute a subject worthy for thorough consideration.

#### THE ADVANTAGES OF BRIDGE POLICING

**T**HE CORDONS OF GUARDS now being maintained about important railway bridges bear a certain relation to the organization for policing these structures during times of both war and peace to protect them from that relentless alliance which we know as "the elements." Necessary as protection against the chance traitor or spy may be in the present crisis, it is no less imperative that protection of a different character be provided to guard against the ravages of time. The success with which the attacks of these enemies are repulsed is in large measure commensurable with the vigilance displayed in discovering the points of initial attack and in bringing the necessary forces to stop the incipient damage. For example, every one is familiar with steel highway bridges of light construction in which the floor beams and stringers have been rusted through in a scant five or six years—the results of sheer neglect, while on the other hand, one's attention is drawn from time to time to old iron and timber bridges that have survived the varying seasons for 50 years and more in such good shape that they have promise of long life to come—the compensation for the continuous attention the structures have had from the day they were completed.

One long railroad bridge now being built replaces a cast- and wrought-iron structure that carried railway trains for over half a century—a remarkable record in the face of the ever increasing weights of engines and cars. Much of the credit for this long life is, of course,



due the designers and builders, but not enough emphasis can be placed on the fact that from one to four men were constantly assigned to this bridge—resident maintainers they could be called—whose duty it was to look after the important piece of property placed in their care, to do spot painting, tighten bolts, adjust counters, etc.

Such protection is expensive, but it should be compensated to a considerable degree by the increased life obtained, while it represents, also, an insurance charge to the extent in which it affords protection against accidents and fires? However, it is not to be supposed that policing of this character will serve alone in the upkeep of the structure. If it is to be effective, it is necessary to make appropriations in due time for general overhauling, such as repainting, deck renewals, etc., as frequently as conditions warranting such expenditures are reported by those who make the minor repairs.

#### THE FOURTH LIBERTY LOAN

**T**HE CAMPAIGN for the Fourth Liberty Loan will open on September 28, and continue until October 19. In this interval the drive will be the all-important event before the men in all branches of American industry. To show our determination to back our men in khaki to the successful conclusion of this war it is necessary for all of us to subscribe to the limit of our ability. Transportation is so essential to the conduct of the war that railway men are being left in their positions more generally than in other industries. This imposes an added responsibility on them to contribute to the success of the loan, not only by subscribing themselves, but also by encouraging others to do the same.

The tremendous impetus which Charles M. Schwab has given to shipbuilding has been largely achieved by making every individual engaged in the industry feel a personal responsibility for results and a personal pride in helping to make great results possible. This spirit of accomplishment in the shipbuilding industry has been brought about by the leaders making it a business to come in personal contact with the workers and to inspire the men with a sense of the importance of their work for victory in the war—a sense of personal responsibility, and a spirit of team work.

The creation of that spirit among the workers of the nation in all lines of activity would be of incalculable benefit to the workers themselves, to employers and to the nation. Concretely two of these results would be: (1) To quicken and increase the response to all war measures such as Liberty Loans, War Savings Stamps, the draft, food and fuel saving. (2) It would make the worker feel more keenly his responsibility to do his work (no matter what its character) to the very best of his ability. Make him feel the need of sticking to the job.

Every foreman can be a leader and a center of influence in this work. The man who is in charge of a small gang may feel that *his* circle of influence is too small to be worthy of any effort. That is a mistake. It is the *aggregate* that counts.

The foreman who is in a relatively small circle may not hold so pretentious a meeting—it may not require formal or parliamentary procedure—it may not be especially announced or accompanied by music and oratory. But the foreman who will quietly call a dozen of his men around him and informally, thoughtfully, lead discussion into winning-the-war channels, pointing out the importance to the individual of doing his best in support of Liberty Loans and all other war activities, can do a real service in this way. It can be so well done in no other way that will produce as great results.

## LETTERS TO THE EDITOR

### AN ARGUMENT FOR LARGER TIES

Yard Center, Ill.

TO THE EDITOR:

I believe that we can secure 75 per cent more service from a tie larger than the 6-in. by 8-in. by 8-ft. cross tie now commonly used. I find the 6-in. by 8-in. by 8-ft. tie weak because of its short length and limited bearing surface and carrying capacity. The short tie causes center bound track because of the greater distance from the center of the tie to the rail than from the rail to the end of the tie. Track men have long argued that the track should not be tamped over 10 or 12 in. inside the rail. This is correct, but I have found that where the tonnage is heavy it is not long before the ends of a 6-in. by 8-in. by 8-ft. tie become loose again and are pumping with the passing of each train, creating depressions under the ends of the ties which catch and retain the water and lead to further trouble. In order to keep track up in good surface this condition makes it necessary to resurface the track and retamp the ties every six months. I am not saying that this is being done, but it should be done if one is to have good track.

This condition is particularly serious in gravel or other light ballast. In rock ballast or other heavy materials the track will hold up about 50 per cent better, but even with these materials the ends of the ties become loose in 4 or 5 months and begin to spring up under the heavy tonnage. Every track man knows that center bound track is poor riding track, especially for high speed passenger trains.

The common standard spacing of ties at the present time is on 20 in. centers, giving 20 ties to a 33 ft. rail. The bearing surface of such a panel is 106 2-3 sq. ft. In order to get better results with less expense for maintenance I believe that a 7-in. by 9-in. by 8½-ft. tie is now required for heavy tonnage tracks. A panel of such ties give a surface bearing of 127½ sq. ft. I find that such track requires about one-third of the cost of maintenance, which results in a large net saving even after allowing for the first cost of the ties.

WM. LAWRENZ,  
Supervisor, Chicago & Eastern Illinois.

**AN ENGLISH VIEW**—Every permanent way engineer has fully realized the evil of suspended rail joints ever since they were introduced over 60 years ago. Where a solid rail is supported as between intermediate chairs, the center deflects into a hollow curve under the load, whereas the rail forms a hump over the supports. Cut the rail between the supports and two absolutely rigid ends are left unsupported. The ends are then joined by two plates and four bolts, which together are supposed to be as strong as the solid rail. They may approach this strength when first assembled, but they soon work loose and allow the leaving rail-end to get below the forward end by the bending of the fish-plates both downward and outward. The angle of the top edge of the fish-plates is generally sharper than the angle of repose between the two metal surfaces; the rail consequently acts as a wedge; fish-bolts lengthen in time, and spring washers only mitigate this action and cannot stop it. As soon as motion occurs in any part of the joint its action becomes destructive in all its components.—*Railway Gazette*, London.

# LARGE WAGE INCREASE FOR MAINTENANCE MEN

Roadmasters, Foremen, Clerks, Laborers and Mechanics Will  
Receive Material Advances, Effective September 1

**N**EARLY ALL MEN in the maintenance of way department will receive material advances in pay as a consequence of recent orders of the Railroad Administration. Roadmasters have been given increases of 25 per cent, effective August 1, while foremen and others on a monthly rate will generally receive advances of \$25 per month over the rate in effect on January 1, 1918. Wages on an hourly rate will in general be 12 cents an hour higher than those in effect on January 1, and definite minimum and maximum rates have been established. Thus in the case of trackmen the minimum rate is 28 cents and the maximum 40 cents per hour.

The advance given to roadmasters became effective August 1 through circulars issued by the regional directors. The other advances referred to are the result of supplements applied to General Order No. 27. This order was issued in May and gave advances of 43 per cent and under, as applied to the rates of pay for all railway employees in effect on December 31, 1915. This was found unsatisfactory in a number of cases and led to the appointment of a Board of Railroad Wages and Working Conditions, which has sought to bring about readjustments. Some weeks ago a supplemental order was issued giving additional advances to shop men and others. The newer supplements are known as supplements No. 7 and 8. The latter applies particularly to the maintenance of way department and is given in full below. Supplement No. 7 applies to clerks in all departments, station employees and certain grades of employees in the mechanical department not previously provided for. The portion of this order of interest to the maintenance of way department is that with reference to clerks and specifies that all employees who devote the major portion of their time to clerical work shall receive an advance of \$25 per month, provided, however, that the minimum rate paid will be \$87.50.

The supplements nullify the provisions of Order No. 27, except that any back pay due under the rates established by this order will be paid up to September 1, when the supplements become effective. Both of these supplements contain elaborate provisions covering working conditions, an eight-hour day, promotions, seniority, discipline, grievances, etc. These orders do not cover engineering positions or those of supervisors of bridges and buildings and water service, but it is understood that the wage board now has the wages paid in these positions under consideration.

## SUPPLEMENT NO. 8 TO GENERAL ORDER NO. 27

Effective September 1, 1918, superseding General Order 27, and in lieu thereof, as to the employees herein named, the following rates of pay and rules for overtime and working conditions for all employees in the maintenance of way department (except mechanics and helpers were provided for in Supplement 4, General Order 27, and clerical forces), upon railroads under federal control are hereby ordered:

### ARTICLE I—RATES OF PAY

(a) For all building, bridge, painter, signal and construction, mason and concrete, water supply, maintainer and plumber foremen, establish a basic minimum rate of \$90 per month, and to this basic minimum rate and all rates of \$90 per month and above in effect as of January 1, 1918, prior to the application of General Order 27, add \$25 per month, establishing a minimum rate of \$115 per month.

(b) For all assistant building, bridge, painter, signal and construction, mason and concrete, water supply, maintainer and plumber foremen and for coal wharf, coal chute, and fence

gang foremen, pile-driver, ditching and hoisting engineers, and bridge inspectors, establish a basic minimum rate of \$80 per month and to this basic minimum rate and all rates of \$80 per month and above, in effect as of January 1, 1918, prior to the application of General Order 27, add \$25 per month, establishing a minimum rate of \$105 per month.

(c) For all track foremen establish a basic minimum rate of \$75 per month, and to this basic minimum rate and all rates of \$75 per month and above in effect as of January 1, 1918, prior to the application of General Order 27, add \$25 per month, establishing a minimum rate of \$100 per month.

(d) Rates of pay for all assistant track foremen will be five cents per hour in excess of the rate paid laborers whom they supervise.

(e) For all mechanics in the maintenance of way and bridge and building departments, where not provided for in Supplement 4 to General Order 27, who were on January 1, 1918, prior to the application of General Order 27, receiving less than 40 cents per hour, establish a basic minimum rate of 40 cents per hour, and to this basic minimum rate and all rates of 40 cents per hour and above, add 13 cents per hour, establishing a minimum rate of 53 cents per hour.

(f) For helpers to all mechanics in the maintenance of way and bridge building departments, where not provided for in Supplement 4 to General Order 27, who were on January 1, 1918, prior to the application of General Order 27, receiving less than 30 cents per hour, establish a basic minimum rate of 30 cents per hour, and to this basic minimum rate and all hourly rates of 30 cents per hour and above, add 13 cents per hour, establishing a minimum rate of 43 cents per hour.

(g) For track laborers and all other classes of maintenance of way labor not herein named, who on January 1, 1918, prior to the application of General Order 27, were receiving less than 16 cents per hour, establish a basic minimum rate of 16 cents per hour, and to this basic minimum rate and all hourly rates of 16 cents per hour and above, add 12 cents per hour, establishing a minimum rate of 28 cents per hour, provided that the maximum shall not exceed 40 cents per hour.

(h) For drawbridge tenders and assistants, pile-driver, ditching and hoisting firemen, pump engineers and pumpers, crossing watchmen or flagmen, lamp lighters and tenders, add to the rate in effect as of January 1, 1918, prior to the application of General Order 27, \$25 per month.

(i) The wages for new positions shall be in conformity with the wages for positions of similar kind or class in department where created.

## ARTICLE II—WEEKLY, MONTHLY OR DAILY RATES

For all monthly, weekly or daily rated employees in the departments herein referred to, and not otherwise provided for, increase the rates in effect as of January 1, 1918, prior to the application of General Order 27, on the basis of \$25 per month.

## ARTICLE III—MAXIMUM MONTHLY WAGE

No part of the increases provided for in this order shall apply to establish a salary in excess of \$250 per month.

## ARTICLE IV—PRESERVATION OF RATES

(a) The minimum rates, and all rates in excess thereof, as herein established, and higher rates which have been authorized since January 1, 1918, except by General Order 27, shall be preserved.

(b) Employees temporarily or permanently assigned to higher rated positions, shall receive the higher rates while occupying such positions; employees temporarily assigned to lower rates positions shall not have their rates reduced.

## ARTICLE V—EXCEPTION

The provisions of this order will not apply in cases where amounts less than \$30 per month are paid to individuals for special service which only takes a portion of their time from outside employment or business.

## ARTICLE VI—HOURS OF SERVICE

Eight (8) consecutive hours, exclusive of the meal period, shall constitute a day's work.

## ARTICLE VII—OVERTIME AND CALLS

(a) Where there is no existing agreement or practice more favorable to the employees, overtime shall be computed for the



ninth and tenth hour of continuous service, pro rata on the actual minute basis, and thereafter at the rate of time and one-half time. Even hours will be paid for at the end of each pay period; fractions thereof will be carried forward.

(b) When notified or called to work outside of established hours employees will be paid a minimum allowance of three hours.

(c) Employees will not be required to suspend work during regular hours to absorb overtime.

#### ARTICLE VIII—PROMOTION AND SENIORITY RIGHTS

(a) Promotions shall be based on ability, merit and seniority. Ability and merit being sufficient, seniority shall prevail. The management shall be the judge, subject to an appeal, as provided for in Article IX.

(b) The seniority rights of laborers as such will be restricted to their gangs; except where gang is abolished they may displace laborers in other gangs who are junior in service.

(c) Except as provided for in Section (b) of this Article the seniority rights of employees referred to herein, to: (1) New positions, (2) vacancies: will be governed by Section (a) of this Article, and will be restricted to the maintenance division upon which employed.

(d) Employees declining promotion shall not lose their seniority.

(e) Employees accepting promotion will be allowed 30 days in which to qualify, and failing, will be returned to former position without loss of seniority.

(f) New positions or vacancies will be promptly bulletined for a period of five days at the tool house or in the department where they occur. Employees desiring such positions will file their applications with the designated official within that time and the appointment will be made within 10 days thereafter. Such position or vacancy may be filled temporarily pending assignment. The name of the appointee will immediately thereafter be posted where the position or vacancy was bulletined.

(g) In reducing forces, seniority shall govern; foremen will displace other foremen who are their junior in service before displacing laborers. When forces are increased, employees will be returned to the service and positions formerly occupied in the order of their seniority. Employees desiring to avail themselves of this rule must file their names and addresses with the proper official. Employees failing to report for duty or to give satisfactory reason for not doing so within seven days from date of notification will be considered out of the service.

(h) Employees furloughed for six months or less will retain their seniority.

(i) A seniority roster of all employees in each classified department, showing name, date of entering the service, and date of promotion will be posted in a conspicuous, accessible place in each roadmaster's or supervisor's office. The names of laborers who have been in the service at least six months prior to date roster is posted or revised will be shown, with their relative standing, and the date they entered the service.

(j) The roster will be revised and posted in January of each year, and shall be open to correction for a period of 60 days after date posted on presentation of proof of error by an employee or representative. A copy will be furnished to each foreman or duly accredited representative upon request.

#### ARTICLE IX—DISCIPLINE AND GRIEVANCES

(a) An employee disciplined, or who considers himself unjustly treated, shall have a fair and impartial hearing, provided written request is presented to his immediate superior within five days of the date of the advice of discipline, and the hearing shall be granted within five days thereafter.

(b) A decision will be rendered within seven days after the completion of hearing. If an appeal is taken it must be filed with the next higher official and a copy furnished the official whose decision is appealed within five days after date of decision. The hearing and decision on the appeal shall be governed by the time limits of the preceding section.

(c) At the hearing or on the appeal the employee may be assisted by a committee of employees or by one or more duly accredited representatives.

(d) The right of appeal by employees or representatives, in regular order of succession and in the manner prescribed up to and inclusive of the highest official designated by the railroad, to whom appeals may be made, is hereby established.

(e) An employee on request will be given a letter stating the cause of discipline. A transcript of evidence taken at the investigation or on the appeal will be furnished on request to the employee or representative.

(f) If the final decision decrees that charges against the employee were not sustained, the record shall be cleared of the charge; if suspended or dismissed, the employee shall be returned to former position and paid for all time lost.

(g) Committee of employees shall be granted leave of absence and free transportation for the adjustment of differences between the railroad and the employees.

#### ARTICLE X—GENERAL RULES

(a) For main line, branch line and yard section men, the day's work will start and end at point designated to report for duty at their respective sections or yards.

(b) Employees taken from their regular assignment or outfit, to work temporarily elsewhere, will be furnished with board and lodging at the railroad's expense.

(c) Unless they so desire, except in emergency, employees shall not be transferred from one division to another.

#### ARTICLE XI—RULES FOR APPLICATION OF THIS ORDER

(a) It is not the intention of this order to change the number of days per month for monthly paid employees. The increases per month provided for herein shall apply to the same number of days per month which were worked as of January 1, 1918.

(b) The pay of female employees for the same class of work shall be the same as that of men, and their working conditions must be healthful and fitted to their needs. The laws enacted for the government of their employment must be observed.

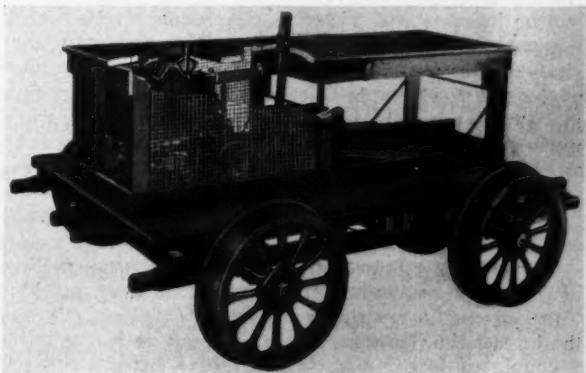
#### ARTICLE XII—INTERPRETATION OF THIS ORDER

The rates of pay and rules herein established shall be incorporated into existing agreements, and into agreements which may be reached in the future on the several railroads, and should differences arise between the management and the employees of any of the railroads as to such incorporation, intent or application of this order prior to the creation of additional railway boards of adjustment, such questions of difference shall be referred to the director of the Division of Labor for decision, when properly presented, subject always to review by the director general.

Agreements or practices, except as changed by this order, remain in effect.

### A NEW FOUR-CYCLE MOTOR CAR ENGINE

A NEW MOTOR CAR with an engine of the four-cycle type has been introduced which conforms more nearly to automobile practice than is the case with most other railway motor cars, and embodies a number of innovations in gas engine practice as applied to railway cars. While possessing the advantages of the four cycle



THE ENGINE MOUNTED ON A CAR

engines which account for their universal use on automobiles, tractors and aeroplanes, the ready reversing feature of the two-cycle engine is retained by a reverse mechanism that changes the direction of the engine itself. Another feature of note is that the engine is water cooled, using a radiator in connection with a closed hopper having a capacity of three gallons. No water is carried in the radiator, but steam from the closed hopper is condensed by it and returned to the engine. This in-

creases the range of travel for one filling of the hopper appreciably, yet the radiator is out of sight and takes up but little room.

Like automobiles, the engine is controlled by a spark timer and a throttle lever, the throttle having the additional function of a cut-off switch, since the closing of the throttle opens the battery circuit. Thus the possibility of wasting the battery while the engine is not running is eliminated. Another feature of this engine is a spark timer having a neutral position of the control lever such that the engine may be started in either direction

without danger of a kick-back while pulling the fly wheel by hand as is sometimes necessary.

The engine has a cylinder diameter and a stroke of  $4\frac{1}{4}$  in. and a rated capacity of 4 hp. with the engine turning over at a rate of 800 r. p. m. It is housed in a frame 22 in. long, 11 in. wide and 19 in. high. The base is  $9\frac{1}{4}$  in. by  $15\frac{1}{2}$  in. and permits bolting through the center sills of a standard car. The weight of the engine is 205 lb. It is manufactured by the North American Engine Company of Algona, Iowa, and has been placed on the market under the name of "The Road Boss."

## Not Entirely According to Rule C

BY M. O. WAY

**I**T WAS A HOT DAY for the section gang working on the limestone ballasted track which reflected the heat of the sun undiminished in their faces, while the direct rays beat down on their lowered backs unmercifully. Nor was there any breeze to relieve them from the simmering heat, for they were at work in the cut, where the air was motionless. The heat was especially severe on McCune, the foreman, a rather small, white-haired man with a full beard that was nearly as white as his head. Though small, he was strongly built and for a man of his age he carried himself well. Being occupied much of the time with his face down close to the rail, he suffered much, for it was like exposing himself to a bed of white hot coals.

It was not surprising, therefore, that McCune finally led his gang to the shade of a tree just beyond the right-of-way fence. This was an unusual procedure; in fact, it happened but three or four times in a summer, for, as the farmers said, "When you see McCune's gang in the shade you know it's hot."

This respite from the torture of the tracks was a great relief to the men and they were soon making the most of the recess, but the foreman remained rather aloof. He was a strict disciplinarian and did not believe in being too intimate with his gang. Moreover, he had other things to occupy his mind; it was a good day for sun kinks and he was not sure of the track this year because of the new steel that had been laid late the previous fall. He was at the end of his section and Smith, his track walker, had not returned, a fact that added not a little to his uneasiness. So he finally stood up and wiped his face with a large red bandana handkerchief.

"Well, men, we will be rolling the car on the track now."

The men rose reluctantly and after the usual preliminaries the gang was headed west toward the town. McCune wanted to see the track himself, now that it was the hottest time of the day, and besides he had to raise a couple of low joints just east of the passing track switch, concerning which Miller, the roadmaster, had given him a "butterfly" that morning.

It was well that they had followed this plan, for they had scarcely set the car off and started to raise the joints when the local, coming up behind them, stopped to head in and Miller, who had been riding in the cab, got down and walked over to where the crew was waiting for the train to pull ahead. His greeting, as was his custom, was rather short, but this did not prevent the foreman returning it with quiet dignity. During his 25 years on the section he had come to take a great pride in his work and in the command of his small crew, and he was not easily

ruffled by the attitude of his superiors. He followed his brief greeting by a question which he had been wanting to ask the roadmaster for several weeks.

"When will we be getting that riprap for the place below Strickland's crossing, where the creek comes up again the dump? The last rain we had cut in some more and I'm thinking the next one will give us trouble enough."

"Yes, you want to watch that. I ordered that rock and it will be here soon, but keep your eye on it in the meantime."

After a further discussion of this and other details of



IT WAS A HOT DAY

the work on the section, the men noted that the train was again under way and as the caboose came by the roadmaster climbed aboard, and stood on the back platform beside Jaycox, the conductor.

"How did you find the old man to-day?" was the greeting of the latter.

"Right on the job; the old man's a mighty good foreman," replied Miller in a manner that indicated that he considered the subject closed, for the old man was a sore spot to him and he did not like to refer to it, but the conductor persisted.

"Don't he go on a tear once in a while? It seems to

me I ran into him a few weeks ago when he was about three sheets in the wind."

Miller replied reluctantly:

"Yes, since his wife died about two years ago he has been going to pieces more or less. About every so often he lets go, but he stays off the job and doesn't get back until he is over it—usually a couple of days. Then he feels sore and if I say anything to him about it he wants to resign. I have accepted his resignation twice, but he has a daughter that he lives with and she comes around and asks me to take him back. Except for these spells he's the best foreman I've got, but I suppose the next time I'll have to let him go for good."

This opportunity was not long in coming. McCune failed to show up one morning and his daughter sent word to the tool house that he was sick. So Smith took out the gang that day and the one following and on the third morning he found the roadmaster waiting for him at the tool house. He had dropped off No. 7 that morning and come to notify the gang that Smith would be the foreman until further notice, for McCune had resigned and would not come back.

For the old foreman, the separation from the service had been most unceremonious. In the remorse which followed his momentary lapse from the ways of sobriety he addressed a brief note to the roadmaster by way of resignation and on the following day received a curt acceptance.

For several days he enjoyed the rest and freedom from responsibility. He idled his time about the town or in his garden, but as it was late in the season there was little for him to do. Moreover, he found that most of his friends were busy during the day and did not have much time to visit with him. So he was compelled to spend most of his time at home. He insisted upon getting up at the same early hour as when he had to be at the tool house at seven and after his breakfast he could hardly resist the temptation to walk down and see the boys off, but he carefully avoided going near the track, and especially the station or the tool house. With so much time on his hands, it was but natural that his thoughts reverted more and more to the work on his section. Was Smith keeping the track in line on the 4-deg. curve at the bottom of the hill, where 603, the only Pacific type engine they had on that district, was continually throwing the track out of line when she plowed around that curve with No. 24? Had Smith repaired the bad places in the fence along Finlay's pasture that he was going to fix that week? Would he raise the joints under the crossing planks just east of the station? These and dozens of other little details recurred to him from day to day, but subordinating all these thoughts was an overwhelming doubt. Could Smith keep up the section as he had done it? To be sure, Smith was a pretty good man, but could he take the responsibility on himself? Bill worked all right when somebody told him what to do, but would he go ahead and push the work along himself?

McCune's daughter noted his growing uneasiness and suggested a trip into the country to visit an old friend, Dan Gillespie, thinking that perhaps the change of scene would give him something else to occupy his mind. He went gladly enough, but insisted on coming back three days before the allotted two weeks had expired. So Gillespie brought him back. On the road into town it was necessary for them to cross the track near the point where McCune had requested the riprap for bank protection. He thought of this quick as a flash as they came to the track and by turning around just as they passed the crossing he was able to get a good view of the em-

bankment alongside the creek. The rock had not been placed. He said nothing about it and brushed the matter aside and, thanks to the diverting incidents of his return home, the matter did not occur to him again.

That evening as he and his daughter sat together on the porch talking over the incidents of the visit, they noticed gathering clouds in the west that foretold a coming storm.

"We'll be after having a storm to-night," he said.

"Yes, it does look like that, father, but don't you worry; your days for going out with a lantern are over. Just think how comfortable you will be to-night in bed when you hear the rain and know that you don't have to get out."

His answer did not come for a long time.

"Sure an' it will be fine," he said at last, but his heart



HIS WORST FEARS WERE CONFIRMED

was not in his words. The storm was slow in coming, and the daughter, noting how tired her father was, urged him to go to bed. He was soon asleep and it seemed to him that he had been asleep a long time when he was awakened by the noise of the rain driving against his window. By force of long habit, he sat right up and reached toward the table near his bed for a match. For twenty-five years a hard rain like that had meant long hours on the track, but just as he was about to strike a light, it occurred to him that he did not need to get up, he could go right back to sleep, and with a sigh of relief he lay down again.

However, it was impossible for him to forget the storm. It seemed to be raining harder now and he could tell from the splashing of the raindrops that the ground outside his window was covered with a sheet of water. There must be a heavy run-off by this time, he thought. The branches must be running full. Other questions passed through his mind. Would Smith be out on the track? Would he call the men out? Well, that was Smith's job; he had to get out and look after the section now.

McCune turned over and tried once more to sleep, but the rain kept coming and his mind would revert to the tracks, no matter how hard he tried to think of something else. Would Smith go out? How the water must



be running in the creek alongside the dump below Strickland's crossing. No, he couldn't trust that fellow. He never did. He had to be told everything. McCune sat up in bed, reached out to the table, found a match and lighted it. Turning to the clock, he saw that it was 12:45. Within an hour No. 25 would be along. The old man made his decision instantly, and was out of bed and into his clothes in a time that would have done justice to a much younger man. Going to the closet, he found his slicker and oil hat and after putting these on he pushed his hands into his trousers pockets to see if he had his keys and some matches. Pulling out his key ring he realized that he no longer had a key for the tool house. What would he do? He had no red lantern or torpedoes. Then he thought of the lantern in the kitchen, and taking a red bandana handkerchief out of the drawer, he went out to the kitchen to look for the lantern. Finding this, he tested it to see if it contained a sufficient amount of oil, lighted it and went out into the storm.

The walk to the creek was without incident. He had walked that stretch of track so often that he knew every step. It was pitch dark except for the dim light of his lantern and the flashes of the lightning. There were few lights to be seen in the houses of the town and no lights whatever on the street. It was soon apparent that he had the track entirely to himself; Smith had evidently not considered it necessary to get out. When the old foreman got to the creek he found that his worst fears were confirmed. The water was up to the ties and racing alongside the embankment at a rate that told him of the scour that was taking place below the surface. He looked around for a stick and after some delay he found a small tree branch which he carried back and pushed down into the water. As he had surmised, the bank was almost

straight up and down just beyond the ends of the ties!

The old man reached under his slicker and pulled out his large watch. It was 1:10. No. 25 was due from the east in about 8 min. Nothing would come west on her time unless she was very late, so he did not feel much concerned in that direction, and, wrapping the bandana handkerchief around his lantern, he stumbled along towards the approaching train. When he came to mile-post 385 he stopped, then proceeded and counted off 15 rail lengths. "That ought to be far enough," he thought, "even if she was coming at a good clip."

The expected train was a long time in coming; in fact, she was 20 min. overdue before the electric headlight formed two bright streaks on the flange-polished rails at the curve a quarter mile away, but McCune's anxiety was soon allayed, for the engine had hardly swung around onto the tangent before two short blasts of the whistle told him that his signal had been seen. The train rolled up and came to a stop with the engine almost opposite where he stood, and as he ran up to tell the engineman of the trouble, who should climb down from the cab but Miller.

"Well," said he, "if I had known that you would be here I wouldn't be losing all this sleep. Where is Smith?"

"I don't know. I haven't seen him."

"That is just what I thought; that's why I am here," and as they turned to walk up the track toward the creek, he added, "I guess you had better get back to town just as quick as you can and call the gang out; that is, all but Smith, you needn't bother him, and if you know of a good, reliable man who can run this section without being 'sick' every now and then I wish you would let me know."

"I think I do," said the old man, with a significant look in his eye.



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BRITISH LABOR FORCES AT WORK ON A "RAILROAD TO BERLIN"



*The Twin Tanks at Newburg, Mo.*

## CONCRETE WATER TANKS FOR RAILROAD USE

Several Different Types Were Tried on the St. Louis-San Francisco to Determine Most Suitable

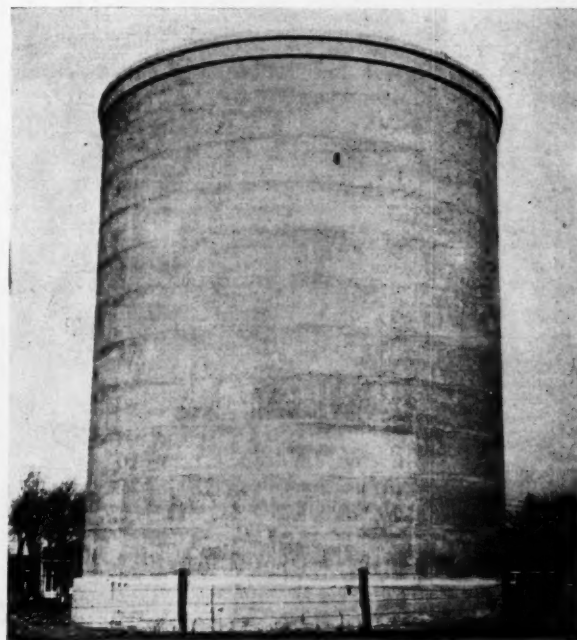
**B**ECAUSE VARYING PRICES of materials have changed the relations formerly existing between different classes of materials applied to various forms of construction, the St. Louis-San Francisco and other railroads have taken steps to determine the nature of these relations under present conditions. As regards water tanks, this has resulted on the Frisco in the construction of a number of reinforced concrete tanks of widely differing designs, with the object of determining which form was best adapted to this purpose from the standpoints of both construction and use. It is of interest in this connection to note that the first tank built was the most complicated, while the one finally selected as best adapted to the service is the simplest.

The first tank built was of 100,000 gal. capacity, and was completed at Springfield, Mo., in 1916. This consists of a cylindrical shell 55 ft. high by 25 ft. outside diameter, supported on a slab of concrete 31 ft. in diameter. Through the aid of a floor or diaphragm in the shell 24 ft. above the ground, the water is confined to the upper 31 ft. of the structure, the lower part serving only as a support for the upper part, with a central column or pier introduced to assist the walls in holding up the floor. This column also contains a 6-in. cast iron pipe which serves both as the inlet and the outlet to the tank.

In the construction of this tank the measures for waterproofing included the use of Medusa waterproof cement, and an effort to concrete the first 8 ft. of the shell above the floor integral with the floor, but this proved to be a rather difficult procedure and some cracks developed subsequent to the completion of the tank. In the later designs the walls of the tank were cast independent of the floor, with special provision for a joint between the two to be filled with an asphalt filler. This method has proved more satisfactory.

Two tanks of an entirely different shape were built at Newburg, Mo., as shown in the photographs and drawings. In this case advantage was taken of the topography of the site to place the tanks on a hill at a sufficient height to provide a gravity flow to the stand pipes. As a consequence the design resolved itself into two simple cylindrical tubs, 35 ft. in diameter by 23 ft. 8 in. deep. Each of these tanks has a capacity of 150,000 gal., all

of which is available for use. Cost records taken on the construction of one of these tanks showed a total expenditure of \$2,400, equivalent to \$16 per 1,000 gal. of storage, or \$22.40 per cu. yd. of concrete. Hydrated lime was used in the concrete for these tanks to insure a



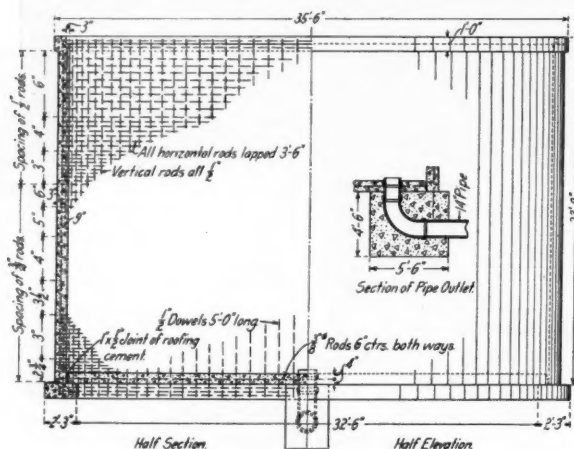
*SIMPLE CYLINDER TANK AT MARSHFIELD, MO.*

greater density, and the interior was coated with an asbestos fiber paint.

The next tank to be built is at Marshfield, Mo., and was completed in October, 1917. This tank is also of simple cylindrical form, 39 ft. 6 in. high above the floor and 34 ft. inside diameter. It affords a total interior capacity of 272,000 gal., but as the bottom of the tank is only 6 ft. above the top of rail, the water in the lower

portion is not available for use, so that the actual effective capacity is 220,000 gal. Thus the water in the bottom simply serves as a support for the effective storage water above. This tank cost \$3,700, or \$16.80 per 1,000 gal. of effective capacity. As this form has proved more satisfactory, another tank of this same type has been built at Cuba, Mo.

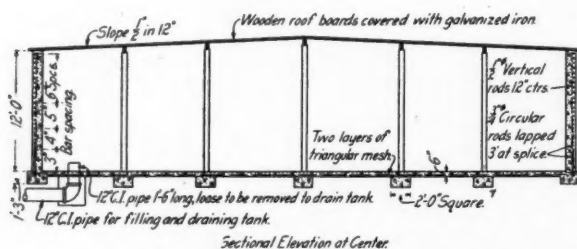
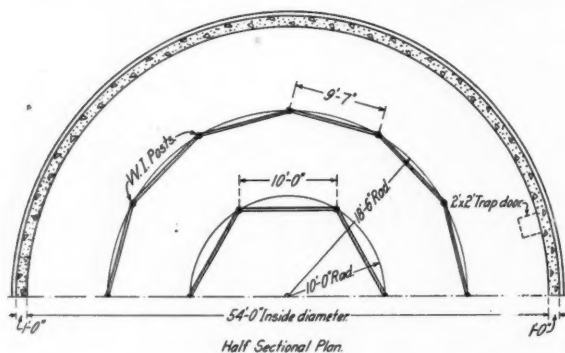
One of the drawings shows a tank of 200,000-gal. ca-



DETAILS OF THE NEWBERG TANKS

capacity of an entirely different form, which was built at Monett, Mo. This is of the type commonly used for settling basins.

The tanks at Springfield, Newberg and Marshfield were constructed with the use of Polk-Genung forms, pouring a height of 4 ft. of concrete every other day until com-



PLAN AND SECTION OF THE RESERVOIR AT MONETT

pleted. This was accomplished by moving the forms and putting in the reinforcing one day and placing concrete on the next. It required a foreman and 10 men to operate the movable forms properly and make an average progress of 2 ft. per day. The joints between every two runs of concrete were formed by a continuous strip

of steel 6 in. high extending entirely around the tank. Splices in this were made with an interlocking joint so that it was practically watertight. The steel ring was pressed down into the concrete to a depth of 3 in. at the end of each day's work.

## OCTOBER MAINTENANCE CONVENTIONS

**T**WO MAINTENANCE OF WAY associations will hold their annual meetings in Chicago on October 15-17, inclusive. The American Railway Bridge and Building Association will hold its meeting at the Hotel Sherman, while the Maintenance of Way Master Painters' Association will convene at the La Salle Hotel. Both of the associations will give special attention to the consideration of problems arising out of the war and their effect on the maintenance of railway structures.

### BRIDGE AND BUILDING CONVENTION

The program for the American Railway Bridge and Building Association is as follows:

#### TUESDAY MORNING

10 a. m.—Convention Called to Order.  
Opening Business and Reports of Officers.  
Report of Committee on Water Supply, (a) Wooden Tanks, (b) Sources of Supply.

#### TUESDAY AFTERNOON

Economical Practices  
Report of Committee on Repairing and Strengthening Old Masonry.  
Paper—Carrying Bridges Over.  
Report of Committee on Use of Concrete.  
Report of Committee on Shipping Company Material Economically.

#### TUESDAY EVENING

Illustrated Descriptions of Recent Important Bridge Work.

#### WEDNESDAY MORNING

The Labor Problem  
Roundtable Discussion of Labor Conditions.  
What the United States Department of Labor Is Attempting to Do for the Railway Labor, by a Representative of the United States Employment Service, Chicago.  
Report of Committee on Small Versus Large Gangs for Maintenance Work.  
Report of Committee on Labor Saving Equipment.

#### WEDNESDAY AFTERNOON

Paper—What Is Essential Work?  
Paper—The Ordering and Handling of Bridge and Building Timber.  
6:30 p. m.—Annual Dinner.

#### THURSDAY MORNING

Report of Committee on Bridge Floors and Guards.  
Unfinished and New Business.  
Election of Officers, etc.

#### THURSDAY AFTERNOON

Trip to Plant of Universal Portland Cement Company, Buffalo, Ind.

### MAINTENANCE PAINTERS' ASSOCIATION

The program for the fifteenth annual convention of the Master Painters' Association is given in full below:

Tuesday, October 15—10:00 a. m.

Opening Exercises.  
Paper—Proper Handling of Paint After It Is Received by the Painter; by S. W. Russell, president, Chas. R. Long, Jr., Co., Louisville, Ky.

2:00 p. m.

Paper—By a Member of Illinois Fuel Administration.  
Committee Report—Painting of Concrete Surfaces; Interior and Exterior; A. B. Phelps (chairman), master painter, New York Central, Cleveland, Ohio.  
Paper—The Paint Question of Today; by W. R. Parker, John Lucas Co., Inc., Chicago, Ill.



Wednesday, October 16—9:45 a. m.

The Labor Situation; by R. H. Ford principal assistant engineer, Chicago, Rock Island & Pacific, Chicago, Ill.  
Paper by C. Barr Field, National Lead Co., Chicago, Ill.  
Paper—Structural Metal Primers and Finishing Coats; by G. G. Mowat, Sherman-Williams Co., Cleveland, Ohio.

Thursday, October 17—9:45 a. m.

Committee Report—Which Makes the Best Maintenance of Way Painter; One Tutored in the Maintenance of Way Work or the One Schooled in Contract Painting? by M. F. Ebel (chairman), master painter, Baltimore & Ohio, Hamilton, Ohio.

Paper—Carbolinum Wood Preservative; by B. M. McDade, railway sales manager, Detroit White Lead Works, Detroit, Mich.

2:00 p. m.

Committee Report—The Volume of Maintenance of Way Painting.

Paper—Cleaning of Iron With Sand-Blast and the Use of Spraying in Painting; by A. E. Wilson, master painter, New York, New Haven & Hartford, Hartford, Conn.

Committee Report—The Indisposition in the Drying of Varnish and the Tendency to "Cess" Off; by Wm. Dunston (chairman), master painter, Duluth, Missabe & Northern, Duluth, Minn.

## Water Waste and Fuel Conservation

BY C. R. KNOWLES

Superintendent Water Service, Illinois Central, Chicago

THE COUNTRY is waging extensive campaigns against waste of food, waste of fuel and waste of the products of the earth and the labor of man. There is no discounting the fact that we cannot oppose our full strength against the most efficient and least wasteful nation on earth until we also eliminate all waste of energy

Chicago is not alone in the waste of water, as New York, Washington, St. Louis and hundreds of other cities have found conditions almost if not quite as bad as Chicago, and have found it profitable to spend thousands of dollars in the prevention of water waste.

While the waste of water on railroads will probably

AT 40-LB. PRESSURE AND 20 LB. OF COAL PER 1,000 GAL. (AVERAGE PRESSURE AT RAILWAY WATER STATIONS)

SIZE OF LEAK	Water wasted per month	Approximate time in which 1,000 gal. escape	Cost at 20c per 1,000 gal.		Lb. of Coal Wasted	
			Per Day	Per Month	Per Day	Per Month
Very thin stream..... $\frac{1}{16}$ in. (Small leak in faucet)	4,711 gal.	7 days.....	\$0.0285	\$0.94	3	94
Thin stream..... $\frac{1}{8}$ in. (Badly worn faucet washer)	18,844 gal.	1 $\frac{3}{4}$ days.....	.11	3.68	12.5	376
One-eighth in. stream..... $\frac{1}{8}$ in. (Overflowing toilet flush)	75,375 gal.	10 hours.....	.45	15.07	50	1,507
One-quarter in. stream..... $\frac{1}{4}$ in. (Small faucet left open)	301,500 gal.	2 $\frac{1}{2}$ days.....	1.92	60.30	201	6,030
Three-eighths in. stream..... $\frac{3}{8}$ in. (Large faucet left open)	702,000 gal.	1 hour.....	4.80	140.40	468	14,040

AT 80-LB. PRESSURE AND 30 LB. OF COAL PER 1,000 GAL. (AVERAGE CITY PRESSURE)

SIZE OF LEAK	Water wasted per month	Approximate time in which 1,000 gal. escape	Cost at 20c per 1,000 gal.		Lb. of Coal Wasted	
			Per Day	Per Month	Per Day	Per Month
Very thin stream..... $\frac{1}{16}$ in. (Small leak in faucet)	6,027 gal.	5 days.....	.04	1.20	6	181
Thin stream..... $\frac{1}{8}$ in. (Badly worn faucet washer)	24,109 gal.	1 $\frac{3}{4}$ days.....	.15	4.82	24	723
One-eighth in. stream..... $\frac{1}{8}$ in. (Overflowing toilet flush)	106,437 gal.	6 $\frac{1}{2}$ days.....	.76	21.28	106	3,193
One-quarter inch stream..... $\frac{1}{4}$ in. (Small faucet left open)	425,750 gal.	1 $\frac{3}{4}$ days.....	2.85	85.15	425	12,772
Three-eighths inch stream..... $\frac{3}{8}$ in. (Large faucet left open)	996,000 gal.	$\frac{3}{4}$ day.....	6.40	199.20	1,039	30,889

in any form. It is proper that placards, letters and the daily press constantly keep before us warnings against waste in its various forms and there is no doubt that great things are being accomplished by spreading the doctrine against waste, but unfortunately little if anything has been said against that colossal waste, the waste of water.

In 1912, City Water Engineer Phillips of the City of Chicago estimated that 67 per cent of the water delivered to that city was wasted, and the most conservative estimate of Chicago's water waste is 200,000,000 gal. daily.

not show as high a percentage as that of Chicago, a very conservative estimate of the preventable waste would be 20 per cent of all water used. The consumption of water by the railroads of the United States is approximately nine hundred billion gallons per year and the cost will average five cents per thousand gallons, or a total annual expense of \$45,000,000 for water. A reduction of 20 per cent through prevention of waste would mean an annual saving of \$9,000,000.

The amount of coal required to pump a thousand gal-

lons of water for general railroad purposes is, of course, variable, as the water is delivered under different heads and is handled by pumps with a wide variation of inefficiency. It is also handled twice in many instances, as with boiler washing and water softening plants. However, a conservative estimate of the average coal consumption per thousand gallons of water pumped is 25 lb. On this basis the coal required to pump the water used by the railroads is approximately 22,500,000,000 lb. or 11,500,000 tons. The saving in fuel through the prevention of water waste would be 2,300,000 tons.

To haul this coal unnecessarily consumed in pumping water to be wasted requires 57,500 cars of 40 tons capacity, or 1,150 coal trains of 50 cars each, or more than three trains of coal per day every day in the year for no purpose other than to permit gross carelessness in the use of water. Thus there is an additional waste of fuel consumed in hauling this coal and in using cars that are badly needed for other purposes. Assuming that 8 days' time is consumed in making a round trip from the mine to the point of consumption and return, and the value of the cars at \$5 per day each, the total loss from this source alone is \$1,150,000.

As an example of what may be accomplished by the prevention of water waste, one middle western railroad showed a saving of \$34,000 per year in the cost of water

purchased from outside parties alone. The total saving was, of course, far in excess of the above amount, as the water purchased was only about 20 per cent of the total consumption and it is only fair to assume that a corresponding saving was made in the water pumped by company forces.

While large wastes, such as overflowing tenders, etc., are important, as a general thing they do not require as much attention to correct as the smaller leaks, such as at wash basins, slop sinks, toilets, urinals and other fixtures connected direct to sewers or drains, as there are a great many more of them. The opportunities for water waste on railroads are many and it is within the power of every employee to save money for the road and fuel for the nation by practicing economy in the use of water, not the economy that stints, but the economy of reasonable use. As before stated, a large leak, such as a bursted pipe which floods everything, does not require much attention, as it is usually corrected in self-defense, but the important leak is the drip, drip, drip of a leaking faucet. The accompanying table shows the effects of small leaks continuing for days and months:

The loss will be rather more than less than the amounts shown above, both in water wasted and coal consumed. From this it is evident that it costs something every minute that one wastes water or neglects a leak.

## Bureau of Standards' Tests of Stucco<sup>\*</sup>

BY J. C. PEARSON,

U. S. Bureau of Standards, Washington, D. C.

THE PURPOSE IN THIS PAPER is to present a brief review of the stucco tests undertaken some years ago by the Bureau of Standards and continued as a co-operative investigation on a larger scale during the last three years. The first stucco tests were started in 1911, and consisted of small panels of metal lath, the majority of which were covered with cement and lime stucco in the approximate proportions of two-thirds part cement, three parts sand, and one-third part hydrated lime, by volume. These panels were erected primarily for the purpose of determining the effectiveness of various treatments or protective coatings of the metal itself in preventing corrosion. These tests (which are still in progress) have demonstrated conclusively that galvanizing is the most effective treatment of metal lath for its preservation, and that a coating of asphalt or "dip" offers a sufficient degree of protection to the metal to ensure its satisfactory durability under average exposure conditions. Many of the painted or dipped lath panels are still in excellent condition after nearly seven years' exposure, notwithstanding the fact that the metal is exposed on the inside and the construction not entirely weatherproof. Perhaps the most important lesson from these original tests, especially in view of later experience, was that corrosion of metal lath is one of the minor obstacles to the development of a successful stucco.

The tests made in 1915 were carried out on a large scale under conditions that simulate actual construction. The test panels were large enough to contain window or door openings, and to allow the plasterer the same freedom of action that he would have on a regular wall. The minimum size of panel that would meet these conditions was decided upon as approximately 10 ft. by 15 ft. The panels were erected during the summer and fall of 1915.

The two ends of the test building are of frame construction, the south end containing four panels of gypsum plaster board covered with a stucco composed of one part cement, three parts sand and one-tenth part by weight of hydrated lime. This was the accepted standard mixture more frequently used than any other on practically all of the various bases.

The corresponding four panels on the north end of the building are of metal lath, the back plastered type of construction. One of these panels was plastered with this same mixture, one cement, three sand, one-tenth hydrated lime. The east and west walls of this test structure are of heterogeneous construction, for the most part masonry of some sort on the first story, and entirely of frame sheathed with 8-in. diagonal sheathing on the second story (with the exception of one panel). The first story contains six panels of monolithic concrete, surface treated in various ways before plastering, nine panels of terra cotta tile, one panel of concrete block, three panels of brick, and three panels of gypsum block. The two door panels are of frame construction covered with Bishopric board nailed direct to studs. The second story contains 15 metal lath panels covered with a variety of stuccos, 3 panels of wood lath plain lathed, 5 panels of wood lath counter lathed, and 1 panel of Clinton welded sheathing stapled direct to studs. Regardless of the distribution of stuccos, the concrete panels as a group have the highest rating, the plaster board panels the lowest. In these tests, the back-plastered metal lath panels probably take second place, and the gypsum block panels are near the bottom of the list.

### METHOD OF FINISHING CRITICAL

There were certain outstanding facts, however, which furnished suggestions for future work. In the first place there was evidence that the prevalence of craze and map

<sup>\*</sup>Abstract of a paper presented before the annual meeting of the American Concrete Institute at Atlantic City, N. J., in June, 1918.

cracking on most of the 1915 panels was due to the method of finishing. It has been specified that a sand float finish should be used, and that this finish should be given in the shortest possible time after laying on the finish coat. The purpose of this was to avoid disturbing the so-called initial set of the cement. In consequence the very great majority of the panels were floated when too soft, which resulted in bringing to the surface a rich mixture of cement or cement and lime, subject to high shrinkage upon drying out. We believe now that this accounted largely for the general and early appearance of fine cracks on most of the panels, with some contribution also from the use of too rich mixtures.

Another peculiarity that impressed itself upon us was the appearance of large and prominent cracks on all the panels over diagonal sheathing. These cracks invariably first appeared off the corners of the windows and running across the direction of the sheathing, and there is no question that they were brought into prominence, if not actually produced, by the shrinkage of the sheathing. The fact that these characteristic cracks did not appear on the back-plastered panels, and that the latter were largely free from prominent cracks, resulted in a higher rating for this group than for the metal lath panels over sheathing.

One other consistent development in these 1915 panels is of special importance, viz.: It was noted that the stuccos on the plaster board and gypsum block panels and on the monolithic concrete panel coated with bituminous waterproofing were in poor condition, especially after they had passed through the second winter. All of these were stuccoed with the standard mixture of one part cement, one-tenth part hydrated lime and three parts sand, with only slight modifications in the method of applying. The results obtained on these panels indicate, not that this stucco is bad, but that the combination of this stucco and a weak base is bad. Field observations which I had an opportunity to make last year demonstrated this fact conclusively, that a strong cement stucco on a weak base is a common cause of stucco failure, and in practice this seems to occur most frequently in the application of brown and finish coats much higher in cement than the scratch coat, which logically should be the strongest portion of the stucco. The explanation of this failure must be sought in the well-known shrinkage of cement mortar upon drying out, and in the subsequent movements caused chiefly by varying moisture conditions.

#### THE TESTS OF 1916

In laying out the program for the second year's work it was found most feasible to erect a sort of monitor or penthouse, providing 22 additional panels, on the roof of the original building. This, of course, precluded all but frame construction. The back-plastered panels had shown up so well in 1915 that it was decided to include a larger proportion of these in the new layout, and only one-half the monitor or annex, as it is more commonly called, was sheathed. To minimize the shrinkage effects 6-in. diagonal sheathing was used, alternating in direction on adjacent panels. It was decided also to change the method of finishing, partly in the use of less water on the under coats, and partly in waiting for the stiffening of the finish coat to develop before finally floating. This procedure, together with the use of a number of leaner mixtures, was adopted in the hope that craze and map cracks would be largely overcome. A number of special features were also included in the construction of certain panels with a view to minimizing the effects of movement of the wood frame. The annex was completed in October, 1916.

Three of the panels were especially constructed in such manner as to free the stucco as much as possible from the movements of the frame. One of these was over wooden studs to which was attached Clin-Trus furring. This is a sort of welded wire frame to which the lath is tied, and which offsets the stucco some 2 in. from the face of the studs. The purpose in using this material was to take advantage of a certain flexibility of support for the stucco, so that if the studs twisted or buckled the strain would not be transmitted directly to the stucco. On another of these panels  $\frac{3}{8}$ -in. Hy-rib lath was wired around the studs, the lath being entirely supported in this way without the use of nails or staples. This panel is without cracks and in perfect condition. The third panel was an adaptation of the Flagg wire partition to an exterior wall. Stout supporting wires were fastened at the top and bottom of the panel only, and then drawn taut by tying them laterally at intervals in such manner as to form a large diamond mesh pattern, upon which metal lath was wired to support the stucco. This panel contains one diagonal crack only running from opposite corners of the window to the frieze and watertable. This crack appeared quite suddenly about six months after the panel was completed, and suggests that possibly the supporting wires, which are necessarily under very high tension, might have slipped in one or more places. In these three panels also a special type of expansion flashing was used around the trim of the windows, designed to prevent the formation of radical cracks at the corners by the pressure of the wooden trim when expanded by moisture. So far as one can judge from the condition of these panels, the flashing has been effective, and is well worthy of further investigation.

Two panels of Bishopric board were included among the 1916 panels, one covered with cement stucco, one with a magnesite stucco. The former showed the same characteristics as the original panels of this type in the development of a number of large cracks, the latter was in perfect condition during the first year of its existence, but now shows some fine cracks near the bottom.

Two additional gypsum plaster board panels covered with cement stucco were also included in these tests, and, as anticipated, showed essentially the same serious deterioration as the original panels of this type. The results obtained from these panels eliminate plaster board from further consideration as a base for cement stucco. The combination is wrong, both in theory and practice.

One panel was erected on pressed steel studs, covered with  $\frac{3}{8}$ -in. Hy-rib lath and stuccoed with a mixture of one part cement, four parts sand and one-tenth part hydrated lime, by weight. We expected much of this panel and it is in very good condition, but a number of fine cracks can be detected on close observation.

The only other panel worthy of special mention is one of ribbed lath, back plastered, and stuccoed with a mixture of one part blended cement and three parts sand. The blended cement was prepared in the laboratory by grinding together equal parts of Potomac River sand and normal Portland cement to about 90 per cent through the No. 200 sieve. The mixture, therefore, contains one part Portland cement and seven parts sand, of which one part is very finely divided. This panel is one of the finest in evenness of color and texture, but shows a single fine crack over the bridging. This, I believe, was due to carelessness and could easily have been avoided. Certainly the possibilities of blended cement should not be overlooked in future experiments, for the material possesses ample strength, and provides the plasticity which is usually wanting in lean mixtures.



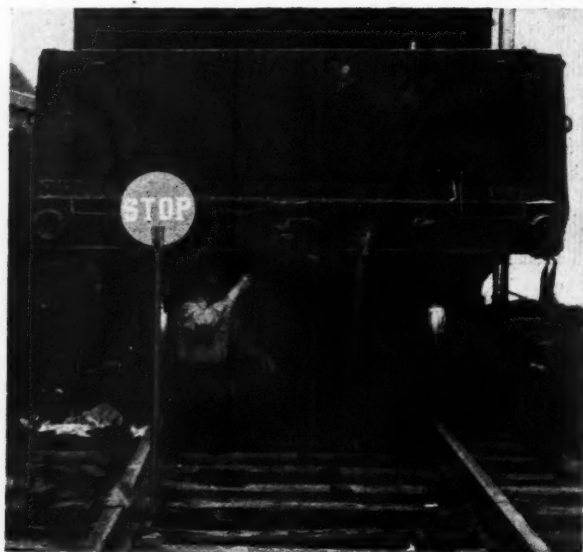
## SUMMARY OF 1916 TESTS

The deductions from the 1916 tests may be summarized as follows:

1. Diagonal sheathing of unseasoned wood is apparently an unsatisfactory backing for stucco. With only unseasoned wood available horizontal sheathing would appear to be better construction, provided sufficient bracing of the wood frame is assured.
2. Back-plastered construction appears to be best for frame structures, so far as the integrity of the stucco is concerned. This carries with it, however, a need for fuller information regarding the insulating qualities of walls so constructed.
3. Lean mixtures promise better cement stuccos, provided the necessary plasticity and density can be maintained by proper grading of the aggregate.
4. There is still need of further information as to the value of wood lath and high lime stuccos. To date the tests indicate that wood lath is not as satisfactory as metal lath, and there is no conclusive evidence that a modern hydrated lime stucco will endure satisfactorily in severe climates.

## A NEW PORTABLE DERAIL

**A** NEW PORTABLE DERAIL has been developed for protecting standing cars, such as bad order cars on repair tracks and bunk cars, which possesses a number of distinctive features. As in other types of derails designed for this same purpose, it consists of a cast block having a top so shaped as to guide the wheel off the rail. It has two integrally-cast clamps which grasp the under



THE DERAIL IN USE

side of the rail head on the outer side, to hold the derail in place with the help of a movable bolt or plunger provided on the gage side which bears against the web of the rail. This plunger is carried in a socket depending from the body of the casting and is provided at its outer end with a socket to carry a flag or target staff.

The adjustment by means of which this plunger is enabled to hold the derail firmly on the rail while permitting its ready removal whenever necessary, is obtained by a combination of a sliding and turning motion. When the target is in a vertical position or nearly so, the plunger is brought in hard bearing against the rail

web, but when the target staff is pushed down into a horizontal position the pressure of the plunger on the rail is released and the plunger may be entirely removed from its socket, thereby permitting the removal of the derail from the track. An arrangement is provided for locking the derail in position with a padlock, it being the idea to furnish keys for this lock only to the men responsible for the cars to be protected. The derail weighs 36 lb., so it can readily be carried about by one man. The device is manufactured by the Reading Specialties Company, Reading, Pa.

## LIGHT RAILWAYS BEHIND THE FRONT

**T**HE PROCEEDINGS of the St. Louis Railway Club for July 12 include a letter from Major F. G. Jonah, formerly chief engineer of the St. Louis-San Francisco, addressed to B. W. Frauenthal, secretary of the St. Louis Railway Club, which contains considerable further information concerning the light railways, which is of interest to railway men in this country. The following is an abstract of this letter:

"I am now chief engineer in the Department of Light Railways. These are the little two-foot gage lines that serve the front—that is, they run from the rail heads up to the trenches. The rail head is the point at which transportation on the standard gage lines ceases, usually about 12 miles back from the front line. From there transportation forward is by motor truck and the light railways. These little lines are laid with rails weighing 25 lb. to the yard, supported on wood ties 4 in. by 6 in. by 4½ ft., although a great deal of our track will be laid on steel ties, rail bolted to the ties. Steel ties are ¾ in. thick by 5½ in. wide, 3 ft. 7 in. long. The rail is in sections of five meter lengths (16.4 ft.). Track is assembled at central yards, taken out on cars and connected on the grade. When track is laid on wood ties we use longer rails (24 to 30 ft.) and track is laid in the usual way.

"Our engines are Baldwins, weighing 20 tons with coal and water. We also have gasoline tractors of 35 and 50 hp. The cars consist principally of gondolas, 24 ft. long over couplers and 6 ft. 8 in. wide. They are of 11 tons capacity. We use grades up to 3 per cent and curves as sharp as 35½ deg. We can then go most any place. We haul rations, ammunition, forage, road material, engineer material and troops to and from the front lines. We ballast these roads in good shape, as the long, wet winters would render them useless unless ballasted. The tonnage handled from a rail head will depend on the area of front lines served and whether the sector is active or not, but at times the tonnage will run up so that it would be absolutely impossible to handle it with motor trucks. It would not be possible to concentrate enough motor trucks for the purpose around the rail head.

"Maintenance work, on those lines, especially up at the front, consists in removing sections of track which have been hit by Fritz's shells. A maintenance gang has the usual equipment of track tools, plus a steel Stetson and a gas mask for each man. The telephone operators on these front lines live in a bomb proof dugout. These chaps all get a little excitement in theirs, but there are not as many casualties as you would imagine.

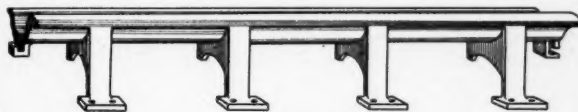
"Our broad gage work is under another department and they are doing a great deal in the way of enlarging port facilities, terminals, cut-offs, etc. Moving pictures will be shown in the States shortly, I think, which will illustrate our activities in the transportation lines.

"Speaking of the French standard gage lines, I may

say that they are better built than our lines in America. They are almost invariably double tracked. You never see a wooden bridge or building and seldom a steel one. Everything is in stone, and I believe they have the finest masonry in the world. Rail is usually as heavy as 80 lb. per yard. Ties are all creosoted and the screw spike is generally used. I saw some dating nails in ties which showed they had been in track 25 years. Evidently creosoting is done better than with us. The French engines are better built than ours, but they are not as heavy; their cars are light. I believe the American type of equipment is best. I consider their dining car service better than ours. They serve a table d'hôte meal and it is always well cooked and served. Girls do the serving. You can get a very good meal, with a bottle of wine included, for about \$1.25.

### A MALLEABLE IRON FLANGEWAY GUARD

CONSIDERABLE USE is being made of a sectional malleable iron flangeway guard as a means of producing an effective and permanent flangeway for highway grade crossings and station platforms. Among the



*Elevation of One Complete Unit.*



*Cross Section of the Guard in Place.*

#### DETAILS OF THE FLANGEWAY GUARD

advantages to be claimed for this form of construction are that it is simple to install, prevents heaving of the planking, produces a permanent flangeway for the railway, while providing a smooth crossing for the vehicle

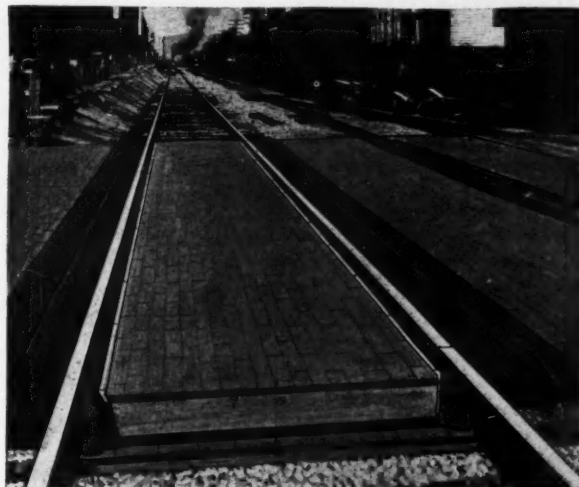


THE FLANGEWAY IN A STATION PLATFORM

traffic, is adaptable to all kinds of paving, and can be installed at reasonable expense.

As shown in the drawings, it consists of a trough section bounded by two flanges, one of which abuts against

the paving material, while the other bears against the fishing surface under the head of the rail. This trough is supported by legs spaced one foot apart and terminating in a horizontal flange provided with holes for spiking it to the ties. These legs are cast integral with the trough, forming units four feet long. A sliding interlocking joint at each end of these units provides the means for securing adjacent units in a simple yet effective manner. End pieces are furnished which provide for flaring the flangeway out and downward, giving a finished appearance to the construction and reducing the possibility of accident from dragging equipment. The structural combination of a flange under the rail head with a spike con-



THE FLANGEWAY IN A PAVED CROSSING

nection to the tie insures against any possibility of the flangeway coming loose from the rail. It also forms a neat curb against which to lay the planking or other pavement. To pass rail joints, the only precaution necessary is to lay out the work so that the joints in the flangeway construction do not come opposite those in the rail. The portion of the flange which comes opposite the rail joint is cut away with a cold chisel or hack saw, an operation which readily permits a neat fit around the angle bar or other form of joint used.

This construction has been used on approximately 25 railroads for periods up to 3 years. Among other roads the Pennsylvania is using it in station platforms at a number of points, including Altoona, Pa., and Lancaster. The Pittsburgh & Lake Erie, the Pennsylvania Lines, the Big Four and other roads have also used it at crossings. This device is known as the C. R. S. Flangeway Guard, and is manufactured by the Cleveland Railway Supply Company, Cleveland, Ohio.

**BUY LIBERTY BONDS**—The American soldier swears by his rifle. Machine guns are powerful weapons, hand grenades and trench bombs may be heady at times, but when it comes right down to real sure-enough fighting in the open, where the enemy can be seen, give the dough-boy a rifle every time. The ease with which he can pot a leaping Boche at a hundred yards has amazed the soldiers of the French and British armies. Give the Yanks time and rifles enough and they will drive straight through to Berlin. The boys will do the shooting, but it is up to those who stay at home to provide the rifles. We must provide our share and we can do it by subscribing our quota and more of the Fourth Liberty Loan.

## FIRE HAZARD OF CREOSOTED WOOD

**I**N A DISCUSSION of the fire hazard of creosoted timbers published in the Quarterly of the National Fire Protection Association for April, 1918, Hermann von Schrenk, consulting timber engineer, St. Louis, Mo., states that creosoted timbers when freshly treated are highly inflammable, due no doubt to the giving off of gases of a highly inflammable nature. As the creosoted timber ages, there is a marked reduction in inflammability, until after five or six months it will have the same degree of inflammability as untreated timber, and from then on becomes less inflammable. The reason for this is that the high flash point of the oil usually used requires a very high initial temperature to set it on fire. This is particularly true of the oils used at the present time, the flash point of which is about 280 deg. F, whereas the oils used some years ago had a flash point of about 210 deg. F. As the oil evaporates, the compounds left in the outer layers on the outer surface of the wood require an increasing temperature to set them on fire. As this coating increases, the inflammability of the timber decreases, and finally, when all vaporization has ceased, the timber is in a measure fire-proofed by the coating. It is, however, possible to ignite the timber even after this coating is formed, but it does not ignite as easily as the same kind of timber untreated and in the same state of dryness.

After a creosoted stick of timber starts to burn, it appears to burn fiercely, making a large amount of black smoke. After the fire has gone out, it will be found that a surprisingly small amount of charring has taken place, due doubtless to the fact that the heat generated by the burning of the outer layers causes the creosote oil to be fed from the inside of the stick very much after the nature of a wick; in other words, the oil burns, but the amount of heat developed is largely used up in vaporizing the oil, leaving the wood more or less protected. This has frequently been experienced on burning bridges, where the creosoted stringers have caught fire. After the fire the stringers were found to be charred, but they had been only slightly weakened, and in many instances were still able to hold up the structure.

Based on the results of both theoretical and practical experience, it may be said that creosoted material when used with proper design is somewhat less subject to ignition, consequently it can be regarded as a safer risk

than untreated timber. One additional reason for this is that the untreated timber, particularly if it has sapwood, starts to decay, and the punky decayed timber offers a good point for starting a fire.

## TEN RULES FOR FOREMEN\*

1. *Be Fair.* Have no favorites and no scapegoats. A foreman has to act as judge many times every day; therefore, he must be just.

2. *Make Few Promises and Keep Them.* A foreman must be the exact opposite of a politician. Politics is the art of making promises; and sometimes a foreman forgets that his job requires a far higher standard of truth and honor than prevails in politics.

3. *Don't Waste Anger, Use It.* Your anger is the most valuable thing you have; but you should not use it carelessly. Keep your most forceful language for special occasions. Before a foreman can control other people successfully he must learn to control himself.

4. *Always Hear the Other Side.* Never blame a worker until he has been given a chance to give his point of view.

5. *Don't Hold Spite—Forgive.* When you have had to scold a worker, be sure that you go to him the next day in a friendly way and show him how to do something. There should always be blue sky and sunshine after a storm.

6. *Never Show Discouragement.* Never let yourself be beaten. A foreman must have perseverance, and "never say die."

7. *Notice Good Work as Well as Bad.* Mingle praise and blame. Let the workers see that you can appreciate as well as condemn.

8. *Watch for Aptitudes.* Take a keen human interest in your workers. Notice them. Study them. Put each one where he can do best.

9. *Be an Optimist.* Don't let your worries and troubles deform you into a pessimist. Inspire confidence. Put the "righto" spirit into the works. Say, "Come along men, all together."

10. *Take Your Full Share of the Blame.* This is the most difficult of all. It is heroic, but the foreman who can share both blame and praise with his workers will have discovered the secret of managing men.

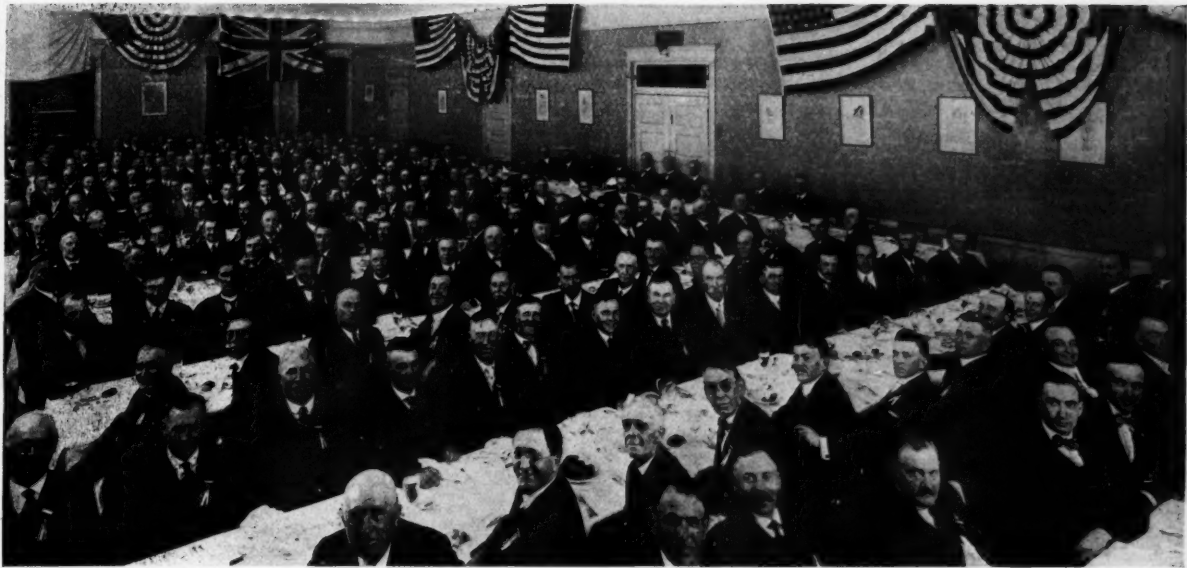
\*Reprinted from the Efficiency Magazine.



British Official Photograph from Underwood & Underwood, New York

A BRITISH ENGINEER COMPANY FOLLOWING UP A GERMAN RETREAT





*The War Dinner on Wednesday Evening*

## ROADMASTERS HAVE VALUABLE CONVENTION

Large Attendance, Excellent Reports and Support of Federal Officers Contribute to Successful Meeting

THE THIRTY-SIXTH annual convention of the Roadmasters' and Maintenance of Way Association, which was held at the Auditorium Hotel, Chicago, on September 17-19, inclusive, was the most largely attended and successful meeting ever held by this organization. Over 600 roadmasters and other officers interested in track maintenance were present from all parts of the country. A large number of these men were sent by the officers of their respective roads at the suggestion of the regional directors and officers of the Railroad Administration. The sessions throughout were characterized by active discussion and great interest. The entire meeting was directed toward the consideration of those problems of the most direct interest in the maintenance of our roads at the present time. The discussion was characterized by a high spirit of patriotism and a desire to do everything in the present emergency to maintain our lines of communication as a military necessity.

The officers of the association of the past year were: President—A. Grills, general roadmaster, Grand Trunk, St. Thomas, Ont.

First Vice-President—J. B. Oatman, roadmaster, Buffalo, Rochester & Pittsburgh, Dubois, Pa.

Second Vice-President—J. W. Powers, supervisor, New York Central, Rochester, N. Y.

Secretary—P. J. McAndrews, roadmaster, Chicago & North Western, Sterling, Ill.

Treasurer—Coleman King, supervisor, Long Island Railroad, Jamaica, N. Y.

### OPENING BUSINESS

The convention was called to order at 9:30 Tuesday morning with over 350 roadmasters in the room. In opening the meeting President Grills emphasized the fact that the convention this year was a war council of the track men on American railways for the purpose of discussing the solution of the problems which present conditions have created. All were invited to take part.

A particularly fortunate feature of the opening session was the presence of three regional directors of the Railroad Administration, namely, B. L. Winchell, director of the Southern region; Hale Holden, director of the Central Western region, and B. F. Bush, director of the Southwestern region. Each of these men responded to requests for short talks, the trend of their remarks being the relation of the men who help to maintain and operate the railroads of this country to their associates who are "over there."

Mr. Winchell, after reviewing present railway conditions briefly, stated that it is his practice to urge the men in his territory to study the manner in which their problems were being solved on other roads in order that they might gain new ideas which they can practice in their territory. He placed particular emphasis on the necessity of railroad men increasing their exertions at present.

Mr. Holden placed particular emphasis on the purpose of the present meeting as a means for the study of the war problems. He called attention to the necessity of maintaining the railway machine in the best possible condition for winning the war and also stated that in this connection it is necessary to keep skilled railroad men in this country. While he admired the spirit of the men in waiving exemption from service, he believed it was of extreme importance that such exemptions be obtained for the good of the railroads. He urged an enthusiasm in the operation of the railroads in their present status. Any considerations as to the relative merits of private or government operation are entirely out of place at the present time, and the matter of the ultimate disposition of the railroads can be left for the period of readjustment after the war.

The necessity for salvaging scrap and all unused material was the keynote of Mr. Bush's remarks, which he illustrated by the results secured in the past two years by the Missouri Pacific, a line of 7,000 miles on which \$600,-

000 worth of track scrap has been accumulated annually. He described the methods adopted to recover and return much of this material to service.

### CONSERVATION OF TRACK MATERIAL

All members of the committee realize the importance of the subject to be considered and the saving which can be effected by close supervision of track materials, both in and out of track.

**RAILS.**—One of the largest expenditures which the railroads make is for new steel rails. A large number of rails are permanently damaged in track because the maintenance forces are unable to take care of them properly, resulting in battered and chipped ends. On a number of roads these rails are taken out of track, a piece is sawed off each end, the rails are redrilled and used again on branch lines. The average cost for this work, including labor, sawing, drilling, oil and saw blades, is approximately 40 cents per ton. The committee recommends this as good practice.

**ANGLE BARS.**—Cracked angle bars can be welded by the acetylene gas process and used again. The cost of this work is from \$1.50 to \$2 per pair. We believe that it would be better economy to scrap the defective angle bars than weld them. Worn and bent joints can be straightened and built up for 20 cents per joint and used again. The bar is heated in an oil furnace, placed in a die and swaged under a drop hammer. In this manner the bar is swelled to its original section by the addition of pieces of steel  $1\frac{3}{8}$  in. by  $\frac{1}{8}$  in. thick placed in the center of the bar.

**TRACK BOLTS.**—A large number of usable track bolts can be recovered wherever rail is being renewed, if they are oiled before renewals are made, at a cost as follows: Per mile for oiling: 4 hours' labor at 30 cents per hour, \$1.20; 1 gal. kerosene oil at 10 cents per gal. and 1 gal. black oil at 13 cents per gal., cost of labor recovering bolts, 4½ cents per bolt. Bolts which are recovered and used in sidings and industrial tracks have an approximate life of eight years.

**TRACK SPIKES.**—Old spikes can be straightened and used again in sidings and industrial tracks at a cost of not to exceed 70 cents per 200-lb. keg. There are a number of different ways of straightening old spikes, but the most approved way and the one recommended by the committee is with a press where from two to four spikes may be straightened at a time. This is a decided advantage over other methods on account of bringing the head back to its original position, where, with the hand method or trip hammer, it is impossible to straighten the heads up.

**WORN SWITCH POINTS.**—These can be made use of in several different ways: (1) By cutting off a sufficient amount of worn point and replanning same; the cost of labor for this method is not less than \$20 per switch. (2) The worn point can be built up by the acetylene gas process at an approximate cost of \$2.25 per point, but a point so built up should only be used in sidings.

**FROGS.**—Worn and broken frogs can be repaired at a large saving over the cost of new frogs. To repair these frogs in the shops costs considerably more than by the acetylene gas process. To repair a 90-lb. spring rail frog in a shop with bolts, rivets and new wing rail, including labor and price of rail, will cost \$70. A new frog of this kind costs \$160. A No. 9, 100-lb. spring rail frog, with new short points, bolts and rivets, including labor, will cost \$45 to repair. The cost of a new frog is \$152. Rigid frogs can best be repaired with the gas process at approximately the following cost: New point and both wing rails built up and bolted, including the gas and labor charges, from \$12 to \$14 per frog, and by shop

process \$25; saving by the gas process \$13 per frog, with the additional advantage that the frogs can be built up under traffic, if necessary, at a slightly additional cost.

**TIE PLATES.**—No tie plates should be discarded as scrap unless they are entirely unfit for further use, but they should be made use of on storage tracks and industrial sidings. Plates of heavier section can be repunched and used on lighter sections of rail to prevent rails cutting into the ties. This conserves ties.

**TRACK TIES.**—To conserve ties in track they should be inspected in accordance with the association's recommended practice. Ties removed from track should be carefully sorted and those fit for sidings or temporary track piled separately. Ties fit for fuel should either be disposed of to company employees or to outside parties to be used for that purpose, or they can be loaded and used for engine fuel. Good use of track and switch ties can be made for cribbing and docking. No old ties should be burned except those which are absolutely worthless for any other purpose.

**FENCES.**—To conserve the lumber supply the committee recommends a more extensive use of wire fencing and concrete posts.

**CROSSING PLANK.**—To further conserve the supply of crossing plank, which is a very large item, the committee recommends for consideration concrete slabs for highway crossings, tarvia macadam crossings and paving block crossings. Any of these crossings will successfully take the place of our plank crossing if properly installed, requiring less attention, while the cost will not exceed plank crossings, and in some cases would cost less.

**TRACK TOOLS.**—In order to conserve tools, careful inspection should be made at frequent intervals, and defective tools should be sent to shop for repairs.

**SCRAP.**—Now that material is hard to get, a close watch should be kept on the scrap piles. The committee recommends that all scrap be picked up by section forces weekly and placed for loading at designated points and that all scrap be loaded on the divisions once a month, at which time the roadmaster or some competent foreman should accompany the train and all material that can be made use of again sorted out and held for future use. Only material that is scrap should be disposed of. Other material scattered along the track, such as marker lamps, grease plugs, air brake hose, etc., should be shipped direct to the motive power department to be used again.

J. B. OATMAN, roadmaster, B. R. & P., chairman.

### DISCUSSION

In discussing that part of the report relating to the resawing of rails, W. T. Wiltsee (N. & W.) described the methods used in resawing rails on the Norfolk & Western during the last 18 years. It is the practice on that road to cut off  $10\frac{1}{2}$  in. from each end of the rails, so that the third hole of the three-hole joint used by the road becomes the first hole of the new joint. M. McNabb (M. C.) maintained that rails that had been resawed were liable to split or chip at the ends. He believed that rerolling was superior. G. A. Houghton (N. Y. C.) and T. Hickey (M. C.) also gave favorable reports from rerolled rails, although Mr. Hickey added that it was necessary to inspect the rails carefully before rerolling them. P. J. McAndrews (C. & N. W.) called attention to the necessity of classifying the rails carefully before sending them to the mill, as the final size of the rerolled rails depends upon the amount of wear that had taken place on the rail to be rerolled. H. R. Safford, engineering assistant to Hale Holden, director of the Central Western region, stated that it would be impossible to determine the relative

merits of the rerolling and resawing processes by a simple mathematical calculation; that this was essentially an economic problem having various solutions depending upon local conditions.

W. F. Jones, general storekeeper of the New York Central, discussed this report in considerable detail and placed much emphasis on the present necessity of repairing and reclaiming track materials. He stated that many roads are now sending large quantities of mixed scrap out for sale. Some of the larger roads sort this material at central points, and it has been suggested that the small roads may send their material into these central plants on the larger roads for reclamation. He urged the association to appoint committees in each region to study reclamation methods and to recommend practices to the regional officers.

E. B. Temple, engineering assistant to C. H. Markham, director of the Allegheny region, also spoke on the reclamation of material, urging that all scrap be picked up and reclaimed as promptly as possible. He referred to the close attention which the Railroad Administration is giving to the collection of all scrap at the present time, and read reports which he had received from several roads relative to the progress they had made along this line. He stated that the roads must prepare to reclaim much more material than they have done in the past.

In discussing the reclamation of angle bars, M. Griffin (C. R. R. of N. J.) stated that when renewing rail it is his practice to send all bolts found with defective threads to a central shop to be rethreaded and returned for use with the rail in secondary main or in side tracks. Mr. Wiltsee stated that the greatest opportunity for the saving of track materials is with bolts, as they affect the life of the angle bars, rails and other units of materials that go to make up the track structure.

As a means of extending the life of track spikes, A. M. Clough (N. Y. C.) urged that trackmen be trained to use more care in pulling them to avoid bending. He also urged that more bent spikes be straightened on anvils at section headquarters instead of sending them to other reclamation plants. In this way, section gangs can supply a large part of their requirements for side tracks, while the material is not kept out of service for any length of time. In this connection, M. Burke (C. M. & St. P.) referred to the damage done to spikes by careless driving and urged greater attention to this. Mr. Wiltsee stated that track walkers on the Norfolk & Western have recently been provided with loops of steel wire, which they throw over their shoulder and on which they string nuts and washers that are found along the track. These are turned in and are made available for reuse very promptly.

Much active interest was taken in the portion of the report covering the renewing of switch points, particularly by building on additional metal with the oxy-acetylene torch. B. F. Brown (B. & M.) believed it would be uneconomical to repair switch points by splicing. J. Mulvoy and S. Cheatham (M. & O.) also testified to

this condition, stating that the repaired switches wear out very fast. Some experiences were also related with the practice of planing back a switch point to remove the worn portion, thereby making a shorter switch having a somewhat greater switch angle.

J. B. Baker (P. R. R.) described the experience of his road in repairing several hundred switch points during the last 18 months with the oxy-acetylene torch. These points were taken out of the track for this purpose, and have been returned to main tracks, although he would not recommend this, as a general proposition, unless very careful supervision was exercised. Some failures take place, but these result in a condition no worse than that obtaining before the repairs were made. No grinding or other finishing is necessary, if an experienced operator use the torch. In answer to questions concerning the time necessary to train a man, it was said that this required from 10 to 30 days.

In discussing the repair work on frogs, Mr. McAndrews said that this can be done most successfully if the frogs are repaired before the wear has gone too far. H. Van Gorder (C. & N. W.) called attention to the fact that the frogs should be bolted up thoroughly before welding.

In discussing the loading of scrap, objection was raised to inspection while the loading was in progress, since this would result in a delay of the train. Mr. Baker explained that this was done on the Pennsylvania by having most of the classifying and inspection done while the train moved between stations, there being enough room on the cars to do this. He said that no delays were experienced. Mr. Van Gorder said that a train once a month was too often and would be very expensive, but Wm. Shea (C. M. & St. P.) called attention to the fact that

this was a war measure, stating, "It makes no difference how much it costs to collect the materials. If the Government needs it, go and get it."

## COMMON DEFECTS IN RAILS AND MEANS OF DETECTING THEM IN TRACK

By C. W. GENNET, JR.

Manager Rail Inspection Department, Robert W. Hunt & Co., Chicago.

The reports of defective and broken rails generally require the assignment of the individual case to one of six or seven classes. Four classes are certainly sufficient to cover all conditions of what may be termed honest failures; that is, such a condition of the rail as requires its removal from the track, but excluding failures directly due to bad maintenance of track or equipment. The four classes recommended for these reports are:

Class 1—Broken rails; meaning, literally, rails which have broken completely through the section into two or more parts with a generally square or angular fracture through the cross-section and without sign of the final complete fracture having been caused, or contributed to, by any of the other three classes.

Class 2—Broken bases, covering all cases of pieces broken



A. GRILLS, PRESIDENT



out of the base, such as crescent or moon-shaped breaks, and including also complete fractures obviously resulting from a piece originally breaking out of the base.

Class 3—Head failures; including all rails otherwise satisfactory, but which require removal because of defects, such as splits in the head, crushed, mashed, or flowing heads.

Class 4—Web failures, covering all classes of failures obviously originating in the web and extending for some distance along it, and failures at the bolt holes, which might be incorrectly supposed to come under Class 1.

Various subdivisions of these classes might be made in some cases to afford more complete statistics, but, generally speaking, it would seem to be better policy to concentrate all efforts on obtaining accurate records of failures positively known to result from defective manufacture and assign them to the proper one of four classes than to invite possible confusion and error by requiring a more extended and detailed description.

Defects of rails might be broadly classified as either apparent or concealed. Apparent defects are those easily discernible upon inspection at the mill. They consist of flaws occurring on any part of the surface and which result, when seen by the inspectors, in causing the rail containing them to be classified as No. 3 or scrapped according to the size or number of flaws in it. If a flaw occurs near the end of a rail, it may be sawed off, leaving a short length of rail satisfactory for shipment, but frequently a reinspection of short rails locates other flaws so that short length No. 2 rails may result. No. 2 rails are always painted white on both ends and, in addition, two prick punch marks are placed on the web about two feet from each end, so that the rails can be later identified in the track. Short length rails are invariably painted green on each end.

Pipes are often found on the ends of rails, usually in the web or near its junction with the head, and occasionally blisters occur on the web. The detection of either pipes or blisters results in scrapping the rail. Seams resulting from the opening of blowholes in the sides of the ingots when being rolled may occur on any portion of the rail section and manifest themselves in faint lines running in a longitudinal direction. They are generally more easily seen on the head and on the base, but are often hidden from view by scale, so that inspectors sometimes fail to notice them and the rails pass shipment as No. 1, when they should have been No. 2. Laps resulting from imperfect rolling methods are defects which the mills have very largely overcome, but they sometimes show, especially on the sides of rails and cause rejection.

Concealed defects, that is, defects that cannot be discovered by any examination of the rail's surface, are the most important and dangerous. They are without question the direct causes of most of the failures which have been divided into the four classes above mentioned. Flaws, or pipes, or seams, can be detected as described and ample precaution taken to prevent rails containing them from being used in main line tracks, but defects that are concealed in some way afford no protection against the use of the rails, and in many cases no manifestations of the defect occur until rupture results.

The four classes for defective rails suggested above have been put in what may be considered the order of their danger, and they will be so considered here.

#### BROKEN RAILS

Broken rails may result from innumerable causes, some of a chemical and some of a physical nature. It is easy to imagine rails made of steel unduly hard and brittle and hence without resistance to shock. Such steel will produce broken rails, but the physical and chemical tests laid down by the specifications protect against

such conditions to a very large extent. Unfortunately, however, specifications are not what might be termed 100 per cent positive in this respect and examinations of some broken rails have shown them to be of such a chemical composition that their use was unwarranted. Rails have also been known to contain hard spots, due, perhaps, to an imperfect fusion of some of the materials added to the steel when it is in liquid form and no specified chemical or physical tests are apt to detect such conditions. Still, again, rails seem to have a faculty of "just breaking," giving the square or angular fractures across the section that have been mentioned, and beyond the fact that steel has a limit of endurance, which has in these cases probably been exceeded, we are totally unable to assign a cause for the failure.

Such cases as these offer no signs of weakness to either the track-walker or the expert. With transverse fissures they constitute a most dangerous menace to traffic. Transverse fissures are first of a silvery color, invariably in the head of the rail and on the gage side. Their development or growth may extend to the surface, in which event air is admitted to the fracture and discoloration occurs. I am told that such cases can be detected by examining the gage side of track carefully for indications of vertical rust streaks, which are said to be sure evidence of fissures, but, notwithstanding, many failures have occurred when the fissures did not extend to the surface and hence offered no possibility of detection.

#### BROKEN BASES AND HEAD FAILURES

Prior to the general adoption of newly designed rail sections several years ago, the principal features of which are heavier or thicker bases, the most prolific source of rail trouble was due to the thin flanges of the older sections breaking out in the form of half moons or crescent shapes. Much relief has resulted by using the new sections with the thicker flanges, but the cause of the trouble is so intimately connected with maintenance conditions that broken bases still constitute a serious class of rail failures. The piece of the flange that originally breaks off, generally at a tie, is almost always found to show a seam on the surface of the fracture.

Rail manufacturers assert that seams are a perfectly natural effect, to which all rails are susceptible, but the fact remains that various conditions of treatment may greatly influence their production. Be that as it may, the seams on the base, which escape the inspector's attention, being often covered at the mill with newly-formed scale, offer such a reduced strength to the section that it is unable to resist the strains of unequal tie bearings. Pieces, therefore, break out and in many cases complete rupture of the section occurs soon afterward.

Pains must be taken to prevent fractures occurring in this way from being ascribed to class 1, that is, to "Broken Rails." The question as to which class the failure belongs can almost always be answered by examining the fracture across the base. If it is straight from flange to flange, it should be classified as a broken rail; but if it contains a jagged or re-entrant angle, it should be put almost without a doubt in the class of broken bases.

Any condition of quick-flowing metal on the head of the rail, widening or mashing of the head so that the angle bar fit is lessened, or any signs of dark streaks along the polished surface of the rail, are almost sure indications of head failure. Segregated steel is the chief cause attributed to this condition and segregation is one of the natural defects of all steels. Segregation is the condition resulting from the solidification of liquid steel, whereby some of the chemical elements automatically seek

the center and top part of the ingots that remain molten longest. It occurs in that part of the ingot in which the pipe or shrinkage cavity always forms and while both piping and segregation may be retarded or reduced in amount, the total elimination of these natural defects requires the discarding of the top part of each ingot.

Obviously some difficulty exists in determining the amount of each ingot that should be discarded and sometimes when too little discard has been made shipments of segregated, and sometimes piped, rails unintentionally result. Segregation is always found in the top parts of the ingots, and therefore possibly in those rails that are lettered A or B, and defects of the character described as head failures are very largely confined to those rails. As might be expected, segregation results in a hard, high carbon core comprising the center of the rail section, surrounded by metal of lesser carbon content, and, therefore, softer. As mentioned, it may flow rapidly, especially on curves, it may mash down in spots and it may develop the actual cavity from which the term split head is derived. Split heads are not, as a rule, the same as piped rails, for pipes ought by all reason to be limited to the

there was approximately one failure for every two miles of track reported; that is, one failure out of every 600 rails of all makes, weights and conditions. Notwithstanding what records may show, we all know that the subject of defective rails is still a very serious one and that to meet it requires the fullest and most complete co-operation of everyone concerned. "Safety First" must be the motto and the price of safety is eternal vigilance, not only at the mills where the rails are rolled, but, also, in the track where the rails are used.

### FENCES, GATES AND CATTLE GUARDS

A right-of-way fence is as much necessary as any other unit that goes to make a railroad and its proper maintenance is as essential as the upkeep of other parts of the property. A dilapidated fence is not only ugly in appearance, but its condition increases the risk of accidents. For food conservation it is of utmost importance that the railroads keep their right-of-way enclosures in the best condition to prevent any accidental killing of stock. The cost of maintenance as compared with the amount of stock claims paid should not be considered at



J. B. OATMAN,  
Vice-President



J. W. POWERS,  
Vice-President



P. J. McANDREWS,  
Secretary



COLEMAN KING,  
Treasurer

center of the ingot, and hence confined to the web of the rail, while splits are invariably found only in the head. Defects possessing these characteristics are not, strictly speaking, dangerous, but rails containing them should be watched carefully and replaced at an opportune time.

### WEB FAILURES

- These failures are comparatively rare, consisting for the most part of the separation of the base from the head through some kind of longitudinal fracture in the web. Cracked webs can be observed by careful inspection and such rails ought to be removed. The defect often occurs at or near a joint, the fracture probably running into the bolt hole, possibly in such a way that the bars more or less shield it from view. Causes for such defects are not well known, but no doubt loose joints contribute their share, while on rails that have been shipped in vessels it is possible that some damage to the ends may have occurred in the process of loading and unloading that would account for failures of this type.

Rail failures are steadily on the decrease, recent statistics indicating that there were only one-fourth as many failures in five years on rails rolled in 1912 as there were in the same time on rails rolled in 1908. Last year

this time. Instead, the most thoroughly preventive measures should be taken to conserve the supply of live stock.

A large variety of fences is being constructed along the railroads throughout the country and many are being built and maintained that do not fill the needed requirements. A right-of-way fence with only a few strands of barb wire is merely a property line indication; it will not keep out stock and its reconstruction is only a matter of a short time if it is to fill the purpose for which it was intended.

Wooden posts, especially cedar, seem to be as yet the most favored, but the increasing scarcity of timber will eventually eliminate that kind of posts. Round and split posts are being used, but the round post is preferable because the split post exposes the heart and thereby causes decay and the dry rot formed will easily catch on fire.

There are some steel posts manufactured which, it is claimed, give satisfactory service. One type has an angle section with a beveled point, which makes it easy to drive without the use of a driving cap. There is a triangular anchor plate at the bottom that is driven into the ground to offer resistance to side thrusts. The post is punched so that ordinary size staples can be used.

The installation of these posts is very cheap, as from 300 to 500 can be driven by one man in a day, and the decreased cost of installation will overcome the additional cost of the post.

There is also a circular galvanized steel post, to which the fencing is fastened by clips. The cost of installation of this post is somewhat less than that of wooden or concrete posts, as it is driven in the ground by the use of a cap. Also several steel posts can be shipped in the space occupied by one wooden or concrete post.

Concrete posts are being manufactured and used to a considerable extent. The initial price of the concrete post and the cost of installation are somewhat higher than for the wooden post, but considering its lasting qualities it is undoubtedly the most economical. A well reinforced concrete post should last forever, as fire, water and climate do not effect it. The round post is preferable, as the corners of the square post will chip off and weaken it. Railroads may make their own posts by installing plants at points where sand and gravel are available and thus reduce the cost of manufacture.

For general right-of-way fencing the posts should be 7 ft. long. Some railroads are using an 8-ft. post at corners and gate openings, but it seems that a 7-ft. post is of ample length even for that purpose when properly anchored and braced. The 7-ft. post should be set 2 ft. 6 in. in the ground. In swampy or wet ground the post should be tapered at the lower end and driven into the ground with a wooden mallet instead of digging holes by auger or digger. The posts should be placed one rod apart except at corners and gate openings, where they should be placed 10 ft. apart.

Through large towns and other places where appearance is to be considered and also to keep off trespassers, a 10-ft. post is recommended, placed 4 ft. in the ground and 10 ft. apart.

A combination barb and woven wire fence is recommended with (1) a barb wire at the ground followed by a 28-in. woven wire and with three strands of barb wire at the top. (2) A barb wire at the ground followed by a 50-in. woven wire and one strand of barb wire at the top. For use at station grounds where posts are set 6 ft. above ground, a 58-in. woven wire with one strand of barb wire at the top. When posts are set one rod apart, a stay of heavy wire should be placed in the middle of the panel.

#### DETAILS

The anchoring of a fence is one of the vital factors in its permanence. The methods of anchoring vary considerably, but when wooden posts are used the following is recommended: The posts at corners and gate openings should have as anchors two pieces of 2-in. by 4-in. by 16-in. pine lumber securely fastened to the post, one at the lower end of the post and the other 12 in. higher. In addition, the posts at corners and gate openings should have a wooden brace 4 in. by 4 in. gained into the corner post 12 in. from the top and into the second post 24 in. from the ground, well spiked to the posts. As counter brace use two strands of No. 8 wire, twisted until it become a hard and taut cable.

At sudden or abrupt changes of the ground along the fence line where posts are liable to pull out, two 2-in. by 4-in. by 16-in. anchors should be fastened to the lowest point of the post. Instead of using the wooden anchors at corners and gate posts, whenever practicable it is recommended that these posts should be placed in concrete 24 in. square and to a depth of 8 in. below the lowest part of the post.

One of the daily troubles of section forces is to keep the farm gates closed. Quite frequently the farmers

refuse to keep the gates closed because of the fact that the railroad does not furnish a suitable gate. It has been demonstrated by furnishing light, swinging gates that the gates are kept closed more readily than with the heavy sliding gates. The committee recommends a light swinging gate for use at private crossings and whenever possible and where the ground formation allows it, the gates should be hung so they will swing away from the track.

There are no cattle guards made that will turn cattle or other stock, and from data gathered it can be shown that it costs more to maintain cattle guards than to pay stock claims directly due to the absence of the guards, but considering the necessity at the present time to conserve all foodstuffs the committee does not recommend that cattle guards be abolished.

Some railroads are using boards 1 in. by 6 in. for their cross-fences at highways and are spacing them 6 in. apart. The committee recommends the use in the cross and wing fences of the same material as is in the line fences and thereby lessen the cost in material and conserve the lumber.

#### MAINTENANCE OF FENCES

It is the intention of the railroads and the maintenance officers to keep the fences in good condition at all times, but owing to the shortage of laborers, fences are given the last consideration, so frequently no repairs have been made to fences and the material allotted for this purpose is carried over to another season. With the postponement of the work from one season to another it is natural that the fences will be in such condition as to require rebuilding. This is more expensive than proper maintenance at all times.

The average section foreman and laborer take very little interest in the condition of the fences, and, in fact, do not know how to properly repair them. It is the opinion of this committee that in order to keep the fences in repair a small fencing crew, consisting of foreman and four or more men, should be kept on each roadmaster's or supervisor's subdivision. By this arrangement better work will be obtained and more accomplished, as the men constantly engaged in the work will be more efficient. It also will make it unnecessary to distribute the fence material to the various sections.

The committee recommends that laws should be enacted prohibiting the destroying of railroad fences and the opening of paths across the tracks.

C. NEWBERG, roadmaster, C. & N. W., Chicago, chairman.

#### DISCUSSION

J. W. Powers (N. Y. C.) spoke favorably of the steel posts, having had experience with some in use for six years. These have passed through the severe winters of northern New York State with entire satisfaction. He also referred to the concrete posts made by his company, which are giving very good service, but are at a disadvantage as compared with the steel posts on account of the higher cost of placing. James Sweeney (C. & E. I.) mentioned some iron posts, with which he was familiar, that rusted off at the ground line in five years. In reply to this, Dan Foley (M. C.) reported a case with some galvanized round iron posts that had been in use nine years with entire satisfaction, not only as to resistance to decay, but as to stability. An account was given of one installation of 125 miles of concrete posts, placed in 1913, which have given good satisfaction, although the fastening of the fencing to the post was somewhat too loose and caused the fencing to sag in places.



## WHAT THE GOVERNMENT IS TRYING TO DO FOR THE TRACK LABOR SITUATION

By M. G. KIBBE

Railway Division, United States Employment Service, Chicago.

The United States Employment Service has undertaken the task of recruiting man power for the most essential service. The railroad division has been organized for the recruiting of all classes of railroad labor. It is in a class by itself. Unfortunately, we were slow in starting. The wage was low and when the first call was made for common labor at a higher wage by the government it drew more heavily from the railroads than from non-essential industries. A great effort is being made to correct this evil. The railroad wage has been increased to compare more favorably with the increased cost of living. The long haul or transporting of labor from one part of the country to another is being discouraged. The recruiting of labor at so much per head is being abolished. Fee agencies, a most distasteful practice, must no longer exist. When we need men so badly why should they be asked to pay for an opportunity to work?

The government asks for your assistance. Co-operate by placing your orders for men with this branch of the service. Each state has its federal director of employment, and this officer must know how many men you need, as otherwise his powers in drawing from non-essential industries will be of little benefit. The men cannot be gotten in a day, and the only way to get them is to make your wants known that they may be requisitioned from candy stores and ice cream parlors and put to work. No doubt we will get some relief from the farm sections now that our vast crop has been practically harvested. Possibly this may help us out until spring, but the terrible strain of this year and the increased demand upon the roads shows conclusively that extra effort must be made.

At present we are looking to the Mexican for relief, more especially in the Southwest, but Mexicans are always such an unknown quantity and so undependable. Congressional assistance has been granted, but men have been held back on the other side of the border by the political trickster for pecuniary advancement. A Mr. Turner, who was appointed by the Railroad Administration, has been directed to the Mexican border to assist in the importation and distribution of Mexican labor. By co-operation with the United States Employment Service and the United States Immigration Service it is hoped to straighten out the tangle and get more men. Should the situation be cleared, the southwest territory can be supplied during the winter months and in the spring we can ship to northern roads.

Most of you are complaining of a shortage of all classes of help, but to go back to the old methods at this time will bring no relief. On the other hand, the increased wage with better housing conditions and better food will induce a higher class of workers to enlist in this class of work. At the same time physical requirements are necessary. Too many down and outs, not capable of doing a day's work, have been recruited in the past.

The one great word with the Employment Service and the great principle we are working for is co-operation. Let us co-operate to the fullest extent with all branches of the service and with all branches of the government. *Do not let us forget for a moment that we are all working with one great thought in mind and that is to WIN THE WAR.*

The United States Employment Service is destined to

become a great branch of the American government. It has come to stay. Established for the protection of both capital and labor, it is designed to prevent unrest and strikes, to compel arbitration by the appointment of boards, to adjust all differences while business continues without interruption and to avoid the enormous losses experienced in the past. It is true that some are never satisfied. It is also true that some feel that they were not born to work. Compulsory work is as distasteful to them as compulsory education is to others, but they must both be forced to help build up a strong and enlightened nation.

A clearance section has also been established. This department or branch of service makes a complete tabulation of all labor recruited in each state, and these reports go to the general clearance division at Washington. In this way it is possible to ascertain how much labor is furnished by each state, and you can readily see how essential it is that the state director be furnished with these reports promptly. No accurate account can be given unless all report through the same channel. Each state has been given its quota; an estimated number based upon its population and its former record, and as this record has been incomplete no doubt these figures or percentages will have to be adjusted from time to time.

Chicago has been drained to such an extent that it is absolutely impossible to ship as many men to other states as have been shipped in the past, unless many non-essential industries are closed. This part of the service will be looked after by the war industry and community boards, which have already been established. It is their duty to decide what are essential and what are non-essential.

Because the railroad division has been organized only a short time, my remarks must be more in the nature of an appeal for co-operation than a statement of wonderful results accomplished. It might be interesting for you to know that the Employment Service was organized only the early part of this year as a branch of the Department of Labor, that it started with a comparatively small appropriation, that it has grown to such mammoth proportions that the whole country is depending upon it for service, that it already has established some 600 distinct recruiting offices, that it no longer suffers for lack of funds and that its usefulness to both employer and employee is no longer questioned. Our records show that we are recruiting about 12,000 men per month in Chicago for the railroads alone and we need twice that number. I am satisfied that if the East was as well organized as the West we would not be called upon to supply eastern roads. More skilled labor is required in the East because of the many war industries located in that territory, but I anticipate that much of the common labor that has been shipped East will soon drift back into this territory.

### REPORT ON LABOR-SAVING DEVICES

In considering the adoption of labor-saving devices, one of the prime factors in their favor is that they release men needed to perform other duties in the service of our country. The success of labor-saving devices is dependent to a great extent upon the energy and ability of the operator. An over-supply of labor-saving devices is perhaps as detrimental as a shortage of such devices.

The committee recommends that roadmasters consider well before advocating the purchase of heavy and expensive machines, as it is possible that such purchases may not be justified in view of their cost. It also recommends the importance of securing power-driven appliances which are capable of doing many different kinds of work so as to keep the machines in constant use.

## THE MECHANICAL TIE TAMPER

It is the opinion of the committee that no tool furnished to the track forces in recent years made its appearance at a more opportune time or filled a greater void than the power-operated tie tamper. It is the observation of the committee that the work is more uniform and better than in the case of track tamped by hand, especially since we are getting such a poor class of labor. A tamping machine is of particular value around frogs and switches, water pans, tunnels, etc., as it is possible to tamp with it in places which cannot be reached by a tamping bar or pick.

Carefully compiled figures from several reliable railroads covering a period of three seasons are given below:

Cost per mile of track tamped by hand, 32 days at \$12....	\$384.00
Cost per mile of track with a two-tool machine, 16 days at \$14.88 .....	238.08
Balance in favor of machine.....	\$145.92

For a four-tool machine the comparison between hand tamping and mechanical tamping was as follows:

Hand gang and foreman, 16 men working 8 hrs., tamped 500 ft. of track.	
Machine gang and foreman, 6 men working 8 hrs., tamped 528 ft. of track.	
Saving of 10 men and 80 hrs. in favor of the machine.	

## EXPENSE

Hand gang and foreman, 16 men, \$43.50; total.....	\$43.50
Machine gang and foreman, 6 men, \$18.50 (cost to run \$6.95) .....	25.45
Saving by machine.....	\$18.05

Fixed charges are given below as near as it is possible to get them:

Depreciation at .....	10 per cent
Interest .....	5 per cent
Repairs .....	5 per cent
Total fixed charges.....	20 per cent

Experience during the four years this machine has been in use teaches that, under normal conditions in the northern states, each machine will be used during the season to tamp about 20,000 ties.

## RAIL HANDLING EQUIPMENT

As much new rail is received in high side coal cars, it has become necessary that some mechanical device be used for unloading it, not on account of the labor shortage, but to avoid damage to rails by dropping or rough handling. The constant demand for the quick release of cars, the high cost of work trains and the few hours of actual work possible on a line of heavy traffic require a device that will work rapidly with a maximum factor of the safety to laborers. There are rail handling machines in use which are capable of loading or unloading two cars of rail at the same time. Nine men are required for the operation of these machines, one to operate hoists and four men to each car of rails. The machine is operated by air from the train line. Such machines will unload rails more quickly than could be accomplished by 40 men by hand and without damage to rails or injury to men. Thus a saving of 31 men per day is made possible. This machine can also be equipped with tongs to load or unload as many ties with 3 men as can be loaded or unloaded by 20 men by hand.

The committee recommends the use of rail laying machines, especially where rail is of a heavy section, thus relieving tong men for other work, the number released depending on the weight of the rail to be handled. To obtain the best results by the use of such a machine, care

should be used to unload the rails as near as possible opposite where they are to be laid.

The committee is not unanimous in its views as to the benefits to be derived from snow melting devices, but the following figures were submitted by one member:

	Per Day
Two laborers at \$2.80 per day.....	\$ 5.60
Royalty on cans, \$5 per year (used about 5½ months, 2 cans) .....	.06
6 gallons hydro carbon at 11 cents per gal.....	.66
Total cost with melting device.....	\$ 6.32

	Per Day
Foreman at \$3.35—10 laborers at \$2.80.....	\$31.35
6 rattan brooms at 28 cents.....	1.68

Total cost by hand.....	\$33.03
Saving by use of device.....	\$26.71

Another device which can be used successfully for the same purpose is the Hauck snow melting torch.

## TRACK FASTENINGS

We recommend 9 switch plates under each point of a 15-ft. switch and 10 plates under each point of a 16-ft. 6-in. switch, with a uniform riser of ¼ in. on every tie. The risers should be solid and preferably obtained by machining a seat for the stock rail. At least 14 of the plates should provide for braces and where braces are used there should be a shoulder to engage the rail brace and another under the rail brace engaging the base of the stock rail. For heavy service the plates should be not less than ¾ in. by 7 in. under the stock rail. Heel plates should be provided a sufficient distance back of the heel to allow clearance for standard tie plates. Where ¾-in. plates are used under the points the heel plates should be made from 1¼-in. stock, with seats machined out for the lead rail and the stock rail. The depth of these cuts should be such that the elevation of the lead rail is graduated from ¼ in. on the first tie back of the heel to level with the stock rail at the last plate. This construction provides positive shoulders for both the stock rail and the lead rail, and holds the switch to gage at the heel where other construction requires the most maintenance. These plates can be made so that they will accommodate any angle of turnout used with a given length of switch by varying the tie spacing slightly for each angle of frog.

Automatic switch stands can be considered a labor-saving device, as well as a material saving device, as switches can be run through without derailment or damage to the material or equipment. This stand should be as low as is possible to make it. By adopting a stand of this kind, our material will be conserved and the small amount of labor which we can obtain will be available for the much needed repairs to track and will save considerable time in making reports of switches being run through. We are of the opinion that the extra cost of equipping a yard with such stands will be more than saved in a short time through the conservation of company property.

## MOTOR CARS

The majority of the committee are in favor of the use of motor cars, particularly on lines of light traffic where the length of sections is such as to warrant their use. Therefore it is the opinion of the committee that the economy in the use of motor cars decreases in proportion to the number of main tracks, which in turn shortens the length of sections. There is also a large saving in the increased energy of the men when they arrive on the job, in the better class of labor attracted, and in the time saved on emergency jobs. Perhaps the best argu-

ment in favor of these cars is in the fact that thousands of them were bought by the men themselves to avoid the drudgery of hand cars.

The use of motor car mowing machines, weed burners and chemicals to destroy weeds are of great value in some territories.

#### DITCHING EQUIPMENT

On divisions where much ditching must be done by work trains or wheelbarrows, teams with scrapers have been tried with good results and very little labor has been needed. Dirt can be handled in very short cuts, at the ends of cuts and across the track for 20 to 25 cents per yard and it can be hauled 500 to 600 ft. for 50 to 60 cents per yard (with teams at 80 cents per hour and labor at 25 cents per hour).

Where conditions permit mowing the right-of-way with teams and mowing machines, the work can be done by machinery much cheaper than by manual labor.

When heavy ditching has to be done the use of steam ditchers is recommended, together with at least two 16 to 20 yd. side dump cars and a spreader car for short hauls. For a longer haul from four to six side dump cars should be used. A light engine can be assigned to this work. With an outfit of this kind, which includes a train crew, ditcher engineer and firemen, dirt can be handled for 10 to 25 cents per yard, according to the length of the haul. Through long usage the steam ditcher and spreader, especially when the latter is operated by air, have reached such a high state of efficiency that they are practically indispensable and the fact that they can be used for many different varieties of work places them among the most important labor-saving devices of the present time.

A saving of at least 60 per cent over that of manual labor is obtained by using a No. 3 crane for removing ballast from between tracks, preparing for stone ballast, digging drains under tracks, unloading old ballast on fills, strengthening shoulders and filling up holes, loading and unloading rails and for various other purposes.

In rail laying a two-wheel pony car is very handy for distributing spikes, bolts, angle bars, tie plates and even scattered rails. Where a heavy rail is to be replaced in track by a small gang, a pony car makes it possible to load rail and move it to the point where it is needed without sending for additional help or using a flag to get the rail into place. It is also useful for handling ties. With a dump box these cars are very handy for distributing the surplus gravel or stone ballast.

There are many opportunities for improving devices now in general use. To illustrate, a ballast plow can be made to remove all the ballast from the track, whereas at the present time they are made to remove the ballast level with the top of rail. All ballast may be removed by bolting a steel plate onto the present type of plow and permitting the plate to reach the entire length of the tie, only removing enough of the plate to clear the rail and joint fastenings; the depth of plate depending on the height of the rail in the track from which the ballast is to be removed. An attachment to do this work can be made and applied by a blacksmith and helper in two days. Removing and dressing ballast by hand is hard work and very expensive under ordinary conditions. At the present time when sufficient labor is unavailable, this device is of immeasurable value where much ballasting is in progress. In addition to this attachment, another plate with teeth may be applied to loosen up and level off ballast between parallel tracks and on the shoulder. It will also destroy weeds. It can be operated at a speed of from four to six miles per hour. The saving effected

per mile will depend on the amount of ballast to be removed and the density of vegetation.

It is recommended that the field telephone be furnished to ballast and rail-laying gangs, also to work trains and snow plows, particularly on lines with heavy traffic. These outfits can be purchased for from \$5 to \$25 per set, will reduce to a minimum the delays to extra gangs and trains and will result in a saving of money which cannot be estimated closely.

It is recommended that before this convention adjourns arrangements be made for a joint committee of the supply men and roadmasters, which will hold regular meetings throughout the year for the sole purpose of considering any suggestions made by track men or others for labor-saving devices.

J. W. POWERS, supervisor, New York Central, Rochester, N. Y., chairman.

#### DISCUSSION

The portion of this report referring to the use of mechanical tampers created a great deal of interest. In answer to several questions, John Johnson (N. Y. C.) said that the tampers could be used for any lift of  $\frac{1}{2}$ -in. or over at a saving of 25 to 30 per cent for labor. For high lifts it was, of course, preferable to pick up the track with forks and finish the tamping with a machine. William Muff (A. T. & S. F.) asked if the mechanical tamper did not have a tendency to pulverize the ballast where the stone was somewhat soft, to which Mr. Johnson replied that he did not find this to be the case any more than with hand tamping. C. Joyce (Erie) said that he had found that the results were much more uniform and more substantial than with hand tamping. The only obstacle that he had encountered in ordinary section work was that the machine was moved too often for best economy. He emphasized the need of adequate attention to the power plant by a thoroughly competent gas engine man. His experience was that the fuel consumption was 20 gal. of gasoline and one quart of oil in eight hours. J. B. Baker (P. R. R.) recommended the use of an air pipe line in dense traffic territory, as this eliminated portable power plants and the necessity for moving them from place to place. He also mentioned the advantage of electric power for working on electrified lines. It was his contention that the principal economy derived in the use of the mechanical tamper was in the increased interval between track raises as a consequence of the greater permanence of the work done with the mechanical tools, rather than in the increased cost of the actual operation. T. A. Pheny (O. S. L.) inquired as to its use in spotting or joint raising, to which Mr. Powers replied that of the 11 machines in his territory, 4 or 5 were used principally in spotting work. To do this successfully it was necessary for the men to develop considerable skill in moving the machine from point to point quickly. He has two experts to look after the machines and does not allow the foremen to attempt any repairs.

F. J. Meyer (N. Y. O. & W.) characterized the mechanical tamper as a mechanical pick or tamping bar, and that, therefore, this machine can be used in any ballast in which the tamping bar or pick can be used manually, but that it cannot be used for ballast requiring shovel tamping.

In answer to other inquiries, Mr. Powers stated that most men preferred to do the power tamping, although a few objected to it. The machines could be used successfully on compressed air service lines used for charging train lines, as the pressure required is only 70 lb., whereas the pipe lines ordinarily carried 90 to 100 lb.



He also recommended cribbing out before tamping and favored preliminary shovel tamping for any lifts over 2 in.

Mr. Baker said the best results are secured by keeping one gang constantly engaged in this kind of work and moving it from place to place. It is the practice of this road to maintain a supply department for each division to furnish extra parts as required. He mentioned a supplemental use of the machine for cutting ice in tracks during the winter. Caution must be observed in supplying the machines with air from interlocking plants to insure that the pressure is not reduced so much as to make the signals and switch machines inoperative. This can be overcome by use of check valves, which shut off the air whenever the pressure drops below a certain point.

### INSPECTING TIES AND THE OUTLOOK FOR AN ADEQUATE TIE SUPPLY

By JOHN FOLEY

Forester, Pennsylvania Railroad, and Associate Manager of the Forest Products Section, Central Advisory Purchasing Committee, United States Railroad Administration, Washington, D. C.

The Central Advisory Purchasing Committee of the Division of Finance and Purchases of the United States Railroad Administration has to handle many items of railroad materials, and to none is given more attention than to rails and ties. The latter is a question of many phases, involved by local conditions of great variety. The complexity of the problems connected with the procurement of railroad ties may be the reason why in the past they seem to have been given less attention than it is now apparent that they deserve. Now that the problem is being considered as a whole and the efforts of one railroad to supply itself are not vitiated by similar effort by another railroad in its own behalf, its solution is a matter of comparatively short time.

The lack of a surplus of ties to-day is not a development of yesterday. Throughout the more than two years during which you have not had labor enough to put in all the ties you desired, those who make a business of producing ties have been pleading shortage and high cost of labor as reasons why they were not meeting the demands of the railroads. Of course, the railroads could not supply the men needed to make ties, but they supplied the funds which paid the advanced wages of those who continued to make ties by paying more and more for ties, until the prices were beyond the realization of those whose intimate acquaintance with ties ceased far back in the days when they cost 25 to 50 cents each.

Your guesses are as good as mine regarding what the present prices of ties would be if government control had not stopped competition for ties by the united railroads. Coincident with the unified operation of railroads came complaints to the directors of regions producing ties in quantity, that the roads of other regions were taking ties needed by the local roads and by paying high prices for them were forcing the latter to unwarranted expense.

The consequence of these complaints was the issuance last March of an order prohibiting the purchase of ties at prices in excess of those paid December 31, 1917. This order stopped the advancing of prices which was prevalent at that time. It also stopped the production of ties very largely wherever railroads which had advanced prices in 1918 reduced them to the 1917 basis. Many producers who quit then in resentment over the reduction have not resumed operations. Formerly, when an individual railroad reduced the prices of ties the owners

of the ties could ship to a road which paid more. But when the reduction was general, many producers concluded they would engage in a more stable industry. Fortunately, all railroads did not reduce prices; some did not need to and some merely did not buy any until the matter was adjusted.

The ill effects of this order were soon apparent, and in April the prohibition was removed so far as the ties on a road's own lines were concerned. By that time the regional purchasing committees had been organized, and a result of their deliberations over ties was the formulation of the following principles to govern buying:

No railroad under control of the Director General may purchase ties on any railroad not under his control with which such road connects.

Any railroad under control of the Director General may purchase ties on any railroad not under his control with which such railroad connects.

The prices shall be fixed on the various lines by the individual railroad companies, subject to approval by the Regional Purchasing Committee, and at such figures as will cause the production of a sufficient number of ties to meet the requirements of all the railroads.

Every railroad should endeavor to secure the maximum output of ties on its line, so that its own requirements can be met with the minimum amount of transportation.

Ties on railroads which produce more than are needed for their own use, should be transferred under the supervision of the regional committees to railroads on which a shortage exists.

Possibly some of the railroads which protested against shipments from their lines would not have done so had they suspected they would have been saddled with the responsibility and work in the above program. Some are saying they cannot spare any ties, but it is a fair assumption they can ship as many as contractors could under former arrangements. The principles laid down are the logical development of the idea that the railroads under government control are one. For them to compete with one another in the procurement of their ties would be as ridiculous now as it was unfortunate before.

The above rules to govern the purchase of ties were not well received by the tie trade. Naturally, the contractor who had been shipping from one railroad to another, at prices dependent on the necessities of the latter, felt that their business opportunities were lessened by the new plan. However, they advanced no reasons why they should not find entirely satisfactory the sale of their product to the railroad along with it was produced.

In working out the details of executing the above buying principles, the Central Advisory Purchasing Committee, in conference with the regional purchasing committees, decided that the fixed prices should be published and should apply to the ties of all purchasers, large and small. They also decided that payment for ties should be prompt—as nearly on a cash basis as was practicable under the conditions on each road. These decisions were welcomed by small producers of ties, but, of course, are objected to by those who dealt in the ties which the small producers may now sell direct. The attitude of the Railroad Administration is that the dealer is not barred by the present plan from selling as many ties as he can procure from those who require his assistance to make ties or to deliver them to a railroad. There is no limit to the quantity of ties which a railroad may contract to accept from any owner of them.

Gradually the feeling among tie contractors that the administration policy is antagonistic to them is disappearing. At first the contractors jumped to the conclusion that the railroads would develop organizations duplicating those of the contractors. This has not been done by the railroads which for years have bought under

the present plan, and it is not contemplated in business, though advances in prices were quite generally made. You know the prices being paid along your lines and you have a good idea what ties cost to buy, make and deliver. If you are satisfied that the prices published are not sufficient to justify the production of ties, please acquaint your responsible officials with the facts, since prices are "fixed by the individual railroad companies, subject to the approval of the regional purchasing committees."

Prices which bore some relation to one another could not be fixed for the various railroads until a standard was adopted. Consideration of this subject proved how timely was the statement made by a representative tie producer at the 1918 annual meeting of the American Wood Preservers' Association, that "there is another bad feature about the tie business. Every railroad has a different specification and none of them live up to it." Among fifty railroads which are representative of conditions throughout the United States, there were 30 different sizes and shapes of ties specified as standard. Each of these was known as 1 to 5 designations. Ties of exactly the same size would be 1's, 2's, A's, B's on different roads. Different roads used the same designation for ties of different sizes.

You have seen the standard specification which was adopted after full consideration of all existing standards at meetings throughout the country. It omits nothing which could not be agreed upon as essential anywhere. It includes nothing which cannot be lived up to everywhere, like making ties from live trees only, when, as a matter of fact, millions of excellent ties have come from wind-thrown pine trees in the south. It concludes every kind of wood generally used for ties and provides for such others as may be locally desirable. The specification covers all the sizes of ties for which any real desire is expressed. It omits two American Railway Engineering Association standards, the 6-in. by 9-in., because only one railroad specified such a tie to provide for those not thick enough to be 7 in. by 9 in. and the 7 in. by 10 in. because ties of that size are not known in the trade, being manufactured at sawmills, and bought as lumber by the one railroad using them in quantity.

Ties smaller than the standard 6 in. by 6 in., which are fit for some service in secondary tracks, together with culls of larger size, are purchasable as "usable rejects," as heretofore. The desire is that no tie be wasted if it can be of use. The specification provides for the conservation of timber by including a graduation of sizes which will utilize with the least waste those portions of any tree large enough to yield a tie.

In conclusion, Mr. Foley placed special emphasis on the fact that the inspection of ties is to be done by employees on the individual lines along which the ties are produced. He urged that this inspection be made conscientiously, not only for those ties to be used on the home road, but for those to be shipped to other lines as well. As a check on this inspection, he urged the roads which are receiving poor ties to call the matter at once to the attention of the Central Purchasing Committee. He stated that the government is giving the closest attention to the development of all possible sources of supply in this country and is also studying the possibility of importing ties. Based on reports from all sections of the country, he believed that the tie situation is now better than it was two months ago as respects quantity production and that better ties are being produced. While there may be some shortage next year, he did not believe that it would be as serious as is expected in some quarters.

## THE BEST METHOD OF LIFTING TRACK

In submitting this report as to the best method of lifting track, the committee has taken into consideration only three kinds of ballast, rock, gravel and cinders, but it is of the opinion that this method could be applied to other kinds of ballast equally well.

The tracks in the ballast pit should be put in good condition and maintained in such shape while trains are operating over them. Care should be taken that as little curvature as possible be on these tracks and that there be sufficient tracks to operate the pit to the best advantage and its full capacity. All equipment, such as steam shovels, lidgerwoods, plows, ballast levellers, cars, engines, etc., should be in first class condition.

Before commencing to haul ballast, the supervisors, trainmasters and all others concerned should get together with a view to making plans and having them thoroughly understood in order to get the best results as to the manner in which the ballast should be hauled and unloaded. At the end of each day's work a telegraphic report should be forwarded to all concerned, stating the number of cars loaded, unloaded, delays, etc. Supervisors should have it thoroughly understood how the ballast is to be unloaded, that is, so many yards per mile, taking into consideration the height the track is to be lifted.

Care should be taken to secure competent foremen to do the lifting and furnish sufficient men for the work. The number of men is largely governed by existing conditions, that is, the amount of track to be lifted, its location, the traffic, etc. Supervisors should see that good and sufficient tools (more particularly track jacks, as there should be at least two spare jacks) and good boarding cars well equipped, be furnished the men.

Before distributing the ballast, all drains, both surface and tile, should be properly made or laid. Slow orders properly designated by day and night signals should be put on as soon as work actually commences.

All tie renewing should be done before the ballast is unloaded. Track should be lifted against the current of traffic three or four inches or sufficient to facilitate the removal of ties. Track should receive a general good surface and the remaining old ballast should be levelled evenly between the ties and utilized in building the shoulder.

Shoulder stakes should be set in order to insure uniformity in subgrade and shoulder. Track should be put in good line in order that it be moved as little as possible after being lifted with new ballast. After ballast has been unloaded, stake levels should be set.

In lifting track over new ballast, four or six jacks should be used, depending on the number of men to the gang, but no less than four jacks should be used. Both rails should be lifted simultaneously and jacks should be placed two ties ahead of the ones that are to be tamped. The rear jack should not be lowered until the track where the two forward jacks are has been raised level.

The raising of track should be done by lifting one rail and raising the opposite rail with a level. The same applies to elevation on curves.

Men should be assigned specially to the handling of jacks, and the jack handles or levers. This, of course, applies to a large gang of men, but the same can be followed with a small gang of say 30 men. Assigned men should tamp joints and centers and a track jack should be used ahead of the tamping to lift any low spots before dressing.

Before tamping the ties, it is very necessary that all ties fit close to the rail, that they be correctly spaced with

respect to each other and that spikes be properly driven.

Gravel and cinder ballast, where the track is being lifted three inches or more, should be tamped with shovels and all joints tamped from one foot inside the rail to the end with a tamping bar. In stone ballast the final tamping should be done with a tamping bar or tamping pick. The center of the tie for a space of 18 or 20 in. should be tamped lightly.

Gravel and cinder ballast should be dressed slightly below the top of tie. Stone ballast should be dressed 3 in. below top of tie. The committee is of the opinion that when first placing stone ballast in track, there should be not less than 10 in. underneath the tie. The track should receive two lifts, one of 6 in. and one of 4 in. Track should be lined to center stakes and leveled before dressing. Where there is a surplus of ballast after dressing, it can be moved by loading it on push or flat cars, depending on the distance it is to be hauled.

#### RECOMMENDED ORGANIZATION OF GANGS

##### GANG OF 65 MEN RAISING TRACK ON HIGH GRAVEL BALLAST WHERE TIES ARE BEING RENEWED

- 1 general foreman.
- 1 assistant foreman, raising track.
- 1 assistant foreman, supervising renewal of ties.
- 1 assistant foreman, supervising tamping ties.
- 1 material clerk and timekeeper.
- 1 waterman.
- 1 tool man.
- 2 men pulling spikes.
- 1 man collecting old spikes and placing spikes on new ties.
- 1 level man.
- 2 men making jack holes.
- 1 or 2 flagmen.
- 4 jack men.
- 2 jack levelmen.
- 1 man assisting engineer setting center stakes.
- 4 men tamping joints and centers.
- 2 men spacing ties.
- 6 men renewing ties.
- 6 men spiking.
- 2 men adzing.
- 28 men tamping ties.

Flagmen not always required. Track should be lined at conclusion of each day's work. Dressing of track should be done several days after being lifted.

##### GANG OF 65 MEN RAISING TRACK ON OLD GRAVEL BALLAST WHERE TIES ARE BEING RENEWED, BUILDING SHOULDER, ETC.

- 1 general foreman.
  - 1 assistant foreman, raising track.
  - 1 assistant foreman, supervising tie renewals.
  - 1 assistant foreman, supervising tamping ties.
  - 1 material clerk and timekeeper.
  - 1 tool man.
  - 1 flagman.
  - 1 waterman.
  - 1 level man.
  - 4 men pulling spikes.
  - 1 man collecting old spikes and placing spikes on new ties.
  - 6 men renewing ties.
  - 6 men spiking.
  - 6 jackmen.
  - 2 men spacing ties.
  - 2 men adzing.
  - 4 men tamping joints and centers with jacks.
  - 29 men tamping and leveling old ballast between ties and shoulders.
- Old ties to be put in piles each day. Track to be lined at conclusion of each day's work.

##### A GANG OF 80 MEN RAISING TRACK ON HIGH GRAVEL BALLAST AFTER TRACK HAS BEEN LIFTED ON OLD BALLAST AND TIE RENEWALS MADE.

- 1 general foreman.
- 1 assistant foreman, raising track.
- 1 assistant foreman, supervising tamping of ties.
- 1 assistant foreman, lining track.
- 1 assistant foreman, supervising dressing track.

1 material clerk and timekeeper.

1 waterman.

1 tool man.

1 level man.

6 jackmen.

2 men spacing ties and driving spikes to rail.

4 men tamping joints and centers with jacks.

4 men tamping joints with tamping bars.

30 men tamping ties.

10 men lining and lifting low spots.

20 men dressing.

Rough lining to be done at the end of each day's work. Center stakes to be placed after track has been lifted. Dressing only to be done several days after lifting. The foreman and men doing the lining also lift and tamp any low spots.

GEO. BECKINGHAM, superintendent of track, Grand Trunk, Montreal, Que., chairman.

#### DISCUSSION

This report brought out much discussion. One of the points of difference related to the extent to which it is necessary to maintain slow orders when ballasting track. Special emphasis was placed on the necessity of moving slow order signals as the work progresses and keeping bulletins for the guidance of train crews up to date.

The recommendation of the committee that track be raised to the proper level by sighting both rails, as compared with the sighting of one rail and the raising of the other rail by means of a level board brought out a conflict in practices. William Muff (A. T. & S. F.) stated that he had invariably found rough track where the second rail had been brought to the proper elevation with the level board. This is due partially to the sensitiveness of the track level itself in different parts of the day. The practice of this road is to raise the track to stakes set by the engineering corps. On curves the stakes are set on each side of the track, with the elevation in the stakes and the track is raised to the elevation of a board extended between them. It is his practice never to allow a curve to be surfaced without stakes being set.

George B. Beckingham (G. T.), chairman of the committee, defended the report, favoring the sighting of both rails by the foreman as more productive of good results than the general use of level boards by men in the gangs, as it concentrates responsibility on a more experienced person. The clause relative to this subject was finally amended to read that the raising of track should be done by lifting one rail and raising the opposite rail with a level.

W. P. Wiltsee (N. & W.) stated that it has been the practice of the Norfolk & Western to use only two jacks in raising track for many years, one jack being used under each rail. The standard roadway section provides for 12 in. of stone ballast under the track, placed in two lifts of 6 in. each. The track is first tamped with shovels and later with picks. It has been found that two jacks will raise the track as fast as 60 men can put the ballast under.

The recommendation of the committee that the track should be dressed to the top of the tie also created discussion. M. Griffin (C. R. R. of N. J.) told of troubles of installing anti-creepers and difficulties with cinders and accumulations of dirt where the ballast is level with the base of the rail, at the rail. The standard on a number of roads was reported to provide for the top of the ballast to be 3 in. below the base of the rail, and this was stated to have greatly reduced signal trouble in wet weather. A. M. Clough (N. Y. C.) favored the installation of ballast level with the base of the rail as a means of protecting the ties against derailment and reducing the destruction of the track. This added material also provides for shrinkage, which soon comes.



## OTHER BUSINESS

Tuesday evening was devoted to the presentation of moving pictures and slides of labor-saving devices. On Wednesday evening a war dinner was attended by 250 members of the Roadmasters' and Track Supply associations. At this dinner H. R. Safford and E. B. Temple, engineering assistants to the Central Western and Allegheny regions, respectively, spoke on the problems of the present day.

Following the adjournment of the convention on Thursday afternoon, a number of the men went to Bufington, Ind., to inspect several concrete highway crossings installed in tracks at that point. A number of others visited the scrap reclamation plant of the Atchison, Topeka & Santa Fe at Corwith (Chicago).

## CLOSING BUSINESS

At the annual business meeting on Thursday forenoon, the following officers were elected for the ensuing year:

President, J. B. Oatman, roadmaster, B. R. & P., Du Bois, Pa.; first vice-president, J. W. Powers, supervisor, N. Y. C., Rochester, N. Y.; second vice-president, W. P. Wiltsee, principal assistant engineer, N. & W., Roanoke, Va.; secretary, P. J. McAndrews, roadmaster, C. & N. W., Sterling, Ill. (re-elected); treasurer, Coleman King, supervisor, Long Island Railroad, Jamaica, N. Y. (re-elected); directors, F. J. Meyer, roadmaster, N. Y. O. & W., Walton, N. Y.; L. M. Denny, supervisor, C. C. & St. L., Indianapolis, Ind.; J. E. Bone, roadmaster, M. P., St. Louis, Mo.

Chicago was selected as the location for the next convention.

The report of the secretary showed a total of 152 new members received during the year, making a present total of 1,098 members. The treasurer reported a balance of \$1,648 in the treasury.

## THE TRACK SUPPLY ASSOCIATION

The seventh annual exhibit of the Track Supply Association was held in a room adjoining the convention hall. Forty-two firms presented exhibits, which were characterized by the eminently practical and thoroughly tried nature of the devices shown. Owing to the special efforts made by the officers of this organization, the presentation of the display was made much more attractive than in previous years. Labor-saving devices were the predominating element and received the greatest attention.

The officers of the Track Supply Association for the past year were: President, E. T. Howson, editor *Railway Maintenance Engineer*, Chicago; vice-president, J. J. Cozzens, Union Switch & Signal Company, New York; secretary-treasurer, W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y.; directors, F. A. Barbey, Frictionless Rail, Boston, Mass; Edward Coleman, American Hoist & Derrick Company, St. Paul, Minn., and ex-officio, R. A. Van Houten, Sellers Manufacturing Company, Chicago.

The following is a list of the firms which presented exhibits, together with the materials exhibited and the names of their representatives:

Air Reduction Sales Company, New York; oxygen, acetylene, hydrogen and nitrogen gas, welding and cutting apparatus, welding rods and supplies and acetylene generators: R. T. Peabody, E. M. Sexton, W. R. Campbell, Wm. McCarthy, Ray Sosson and Ellsworth Mills.

American Hoist & Derrick Company, St. Paul, Minn.: transparencies and photographs of "American" railroad ditcher; Edward Coleman, C. C. Austin and C. T. Hook.

American Steel & Wire Company, Chicago; railroad fence, woven wire fence and American steel fence posts; L. B.

Shanahan, P. J. Hindmarsh, J. W. Collins, A. N. Frouds and W. E. Evans.

American Valve & Meter Company, Cincinnati, O.; Anderson economy switch stands, Anderson interlocking switch stands and safety switch locks; J. F. McGarry, Dan G. Higgins and F. C. Anderson.

Anchor Company, Chicago; anti-rail creepers; F. B. Bowman, Orlando Metcalf and Geo. H. Chadwell.

Balkwill Manganese Crossing Company, Cleveland, O.; models of Balkwill manganese railway crossings; S. Balkwill.

Bethlehem Steel Company, Bethlehem, Pa.; New Century switch stand, switch stand model 1217, Steelton positive switch stand model 52-A; R. E. Belknap, R. W. Gillispie, Neil E. Salsich and J. F. Hennesy.

Carbic Manufacturing Company, Duluth; Carbic flare lights and cakes; G. B. Van Buren, T. J. Hegland and W. H. Norden.

Chicago Malleable Castings Company, Chicago; Thomas rail anchor tie plates; J. S. Lewellyn, O. Lutz and W. M. Osborn.

Crerar, Adams & Co., Chicago, Eureka bonding drills, Calumet track drills, jacks; E. C. Poehler, C. W. Gregory, W. I. Clock, G. D. Bassett, J. A. Martin and Russell Wallace.

The Duff Manufacturing Company, Pittsburgh; Barrett track jacks, automatic lowering geared ratchet and ball-bearing jacks; C. N. Thulin and G. E. Watts.

Fairbanks, Morse & Co., Chicago; No. 41 light inspection car, equipped with two cylinder kerosene engine; E. C. Golladay, Benjamin S. Spaulding, L. H. Matthews, F. J. Lee, C. B. Skelton, W. B. Lewis and F. M. Condit.

Fairmont Gas Engine & Railway Motor Car Company, Fairmont, Minn.; No. 218 Fairmont roadmaster's inspection car, hand car exhibition engine; W. F. Kasper.

Hauck Manufacturing Company, Brooklyn, N. Y.; Hauck kerosene burner thawing outfits and a steam thawing outfit; Willis C. Squire, G. A. Nelson and A. Busch Hauck.

Hayes Track Appliance Company, Richmond, Ind.; Hayes derrails and stands; S. W. Hayes, R. W. Slautterback and T. Carpenter.

Ingersoll-Rand Company, New York; Imperial tie tamping equipment and air operated track tools; Wm. H. Armstrong, Chas. Dougherty and C. W. Melcher.

Lackawanna Steel Company, Buffalo, N. Y.; rail joints, safety head angle bar, Abbott joint plates, hook shoulder tie plates, rail anti-creepers and key bolts for track appliances; Arthur P. Van Schaick, Jay L. Hench, F. E. Abbott and G. O. Benson.

Luther Grinder Manufacturing Company, Milwaukee, Wis.; grinders, to grind twist or flat drills and miscellaneous tools; C. R. Pfeiffer, F. S. Hyland and J. D. Suter.

The Madden Company, Chicago; illustrations of the three-man rail layer, Veerac motor car and Harris-Muff ballast screen, models of the Wagner switch point straightener, Richter blue flag derail, Red Top fence posts and Blair tie spacer; H. C. Holloway and T. D. Crowley.

The Alexander Milburn Company, Baltimore, Md.; portable carbide lamps, oxy-acetylene welding and cutting apparatus; S. B. Moats and C. R. Pollard.

Mudge & Co., Chicago; Mudge Class E-6-K kerosene inspection motor car; Burton W. Mudge, Robert D. Sinclair, Karl J. Eklund, Robert Deeming, Albert C. Force, Fay E. Posson and Jean K. Vanatta.

National Lock Washer Company, Newark, N. J.; nut locks; R. L. Cairncross and A. T. Thompson.

National Malleable Castings Company, Cleveland, O.; rail anchors, rail braces and tie plates; T. W. Aishton, J. J. Byers and L. S. Wright.

P. & M. Company, Chicago; P. & M., Henggi, Vaughan and Ajax anti-creepers and bond wire protectors; D. T. Hallberg, John Ritchie, John Reagan, George E. Johnson, J. E. Mahoney, F. W. Reeve and P. V. Samuelson.

Pocket List of Railroad Officials, New York; copies of pocket list; J. Alexander Brown, Charles L. Dinsmore and Harold A. Brown.

Positive Rail Anchor Company, Marion, Ind.; rail anchors, Fallon girder type guard rail brace and plate, Busse guard rail; Arnold H. Told, J. A. Shoulty, L. C. Ferguson, Alva M. Bogue and E. A. Le Beau.

The Q. & C. Company, New York; Bonzano rail joint, guard rail clamps, Bonzano rolled steel step or compromise joint, Freeland derrails and Sampson rail bender; B. I. Barber, Bernard McGowan, A. R. Horn and J. V. Westcott.

The Rail Joint Company, New York; standard, compromise, frog and switch and insulated rail joints; W. S. Boyce, J. P. Norton, Alex. Chapman, G. Jenkinson, G. H. Larson, R. W. Payne, E. L. Van Dresser and V. C. Armstrong.

Railroad Supply Company, Chicago; tie plates and derailers; A. H. Smith, H. G. Van Nostrand and E. H. Bell.

Railway Review, Chicago; copies of paper; Willard A. Smith, Harold A. Smith, J. E. Gougeon, Charles L. Bates and W. M. Camp.

Ramapo Iron Works, Niagara Falls, N. Y.; Hillburn, N. Y.; manganese switch point, rolled steel double-shoulder switch slide plate, special switch slide plate,  $\frac{3}{4}$  in. by 7 in., machined heel plate, switch stands, guard rail clamps; Thomas E. Akers, Arthur Germunder, J. B. Strong, J. Edgar Davidson and W. C. Kidd.

Reading Specialties Company, Reading, Pa.; guard rail clamps, rail benders, rerailers with clamps, trolley rerailers, compromise joints and derails; B. John Buell, J. J. O'Connell and R. J. McComb.

Rodger Ballast Car Company, Chicago; improved operating device for improved Hart convertible cars, photographs, catalogs, etc.; H. S. Hart, J. O. Keikirk, W. J. Hosceit and W. E. Money.

Sellers Manufacturing Company, Chicago; Sellers anchor bottom wrought iron tie plates; J. M. Sellers, G. M. Hogan, R. A. Van Houten and R. J. Platt.

Simmons-Boardman Publishing Company, Chicago; copies of *Railway Maintenance Engineer* and *Railway Age*; L. B. Sherman, E. T. Howson, W. S. Lacher and H. H. Simmons.

Southern Railway Supply & Equipment Company, St. Louis, Mo.; Saunders car stopper; W. D. Achuff and L. Boswell.

Track Specialties Company, New York; Trasco guard rail clamp, Superior compromise rail joints, derailleurs, rail benders, tie plates and rail braces, Trasco guard rail brace adjustable track shim, slide plate and switch brace and rail joints; J. A. Bodkin.

Union Switch & Signal Company, Swissvale, Pa.; Keystone insulated rail joint; J. D. Roett.

United States Switch Company, Eau Claire, Wis.; model of automatic switch lock; J. W. Hubbard.

Verona Tool Works, Pittsburgh, Pa.; track tools, track jacks, levels, gages and nut locks; H. C. Mull, E. L. Ruby and E. Woodings.

William Wharton, Jr., & Co., Inc., Easton, Pa.; literature on guard rails, frog and crossing layouts, switch rods and rail clamps; H. F. McDermott, Charles M. Griffith, S. G. Llewellyn, Malcolm Imbrie and J. H. Hock.

Wyoming Shovel Works, Wyoming, Pa.; Red Edge track shovels; H. T. Potter, H. C. Emery, G. E. Geer and A. R. Wren.

At the annual election of this association, held on Wednesday morning, the officers chosen for the following year were: President, Edward Coleman, American Hoist & Derrick Company, St. Paul, Minn.; vice-president, W. H. Armstrong, Ingersoll-Rand Company, New York; secretary-treasurer, W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y.; directors, B. P. Wescott, Q. & C. Company, Chicago; D. T. Hallberg, P. & M. Company, Chicago, while E. T. Howson, retiring president, becomes an ex-officio member of the board of direction according to a rule of the association.

## ANNOUNCEMENT

**O**WING TO THE necessity of conserving fuel, transportation and materials, the War Industries Board has curtailed the supply of paper. In order to effect the desired reduction in the quantity consumed, we have been asked to discontinue all subscriptions upon their expiration unless they are renewed and paid for, to cut down office supplies and advertisers copies and to eliminate every other possible source of waste. This order becomes effective at once.

We are glad to comply in full with the instructions of the War Industries Board with the assurance that our subscribers and advertisers will extend to us their entire co-operation. We urge our subscribers particularly to watch the expiration date of their subscriptions, since it will now be impossible for us to continue their subscriptions after the date of expiration or furnish them with back copies in case they lapse and decide to resume their subscriptions at a later date.

## THE MATERIAL MARKET

**T**HERE IS NO LACK of concrete evidence for the absolute necessity for economy in the consumption of iron and steel products. So serious is the situation that the War Industries Board and the Census Bureau are making a country-wide inventory of all the stocks of steel on hand. At the same time, the officers of the Railroad Administration are emphasizing the necessity of conserving used materials. This was explained in some length by E. B. Temple, assistant to the director of the Allegheny region, in a talk at the Roadmasters' Convention. Not only must all scrap materials be collected, but as much of it as possible must be reclaimed for immediate use. The present estimated total production of steel in sight for the remainder of this year is 17,000,000 tons, while the war demands total over 23,000,000 tons. As a consequence, careful plans are now being prepared for the allotment of iron and steel for next year's consumption. Scrap iron and steel have become very scarce and it is of utmost importance that all available material of this kind be accumulated and disposed of to those who are in a position to put it to some useful purpose.

A few modifications have been made in fixed prices. The manufacturers of malleable iron have established a complete schedule covering various sizes and quantities of this material. Thus castings weighing over 60 lb. each have a price of \$0.074 per lb. for orders of 1,000 or more, and \$0.148 for orders of less than 100; while castings weighing 100 lb. or less have a price of 0.28 per lb. for orders of 1,000 or more, and \$0.60 per lb. for orders of 100 or less; these prices being for plain uncored castings shipped prior to October 1, 1918. A complete set of extras and allowances cover special requirements.

The railroads are still placing a few orders for structural steel, as noted in the news columns.

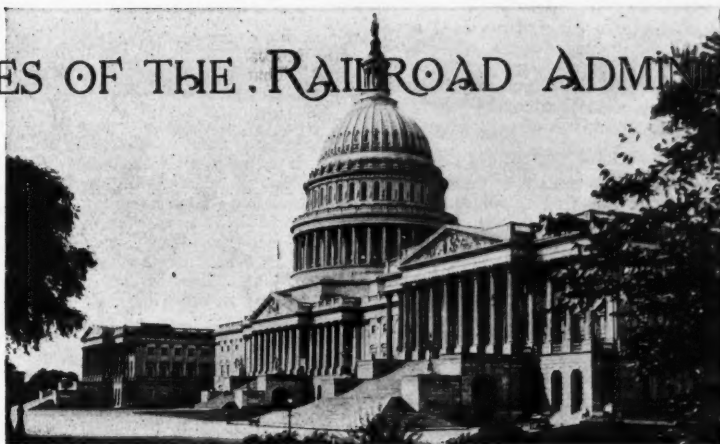
As mentioned in the report of the activities of the Railroad Administration, about 40,000 tons of rails are being rolled per month on orders placed by the individual railroads last year, and special efforts are to be made for a reallocation of such rails as are still undelivered. It is to be expected that some roads are in more serious straits than others and steps must be taken to assign the rails to the roads most in need of them. The Railroad Administration is now in a better position to give such matters more detailed attention as a result of the appointment of engineering advisers to the regional directors and to the director of the division of operation.

New prices for Portland cement were established effective September 1 and in effect to December 31, 1918, of which a number are listed below for carload lots f. o. b. the locations given, not including package. Shipments in bulk are 5 cents per barrel less, while shipments in paper bags are 30 cents per barrel additional, and in cloth bags \$1 per barrel additional. These prices involve some reductions from those given previously, but the most important distinction is the placing of a value of 25 cents on the cloth bags in place of the 10-cent figure obtaining previously. The cement will be generally shipped on seven-day test unless specifically waived, but this does not waive the full requirements of the specifications, including the twenty-eight day tests, and any waiver will be handled direct by the department concerned.

Place.	Per bbl.	Place.	Per bbl.
Universal, Pa. ....	\$1.72	Kingsport, Tenn. ....	\$1.62
Hannibal, Mo. ....	1.67	Houston, Tex. ....	1.77
Buffington, Ind. ....	1.57	Portland, Colo. ....	1.72
Mason City, Ia. ....	1.67	Salt Lake City, Utah... 1.87	
Iola, Kan. ....	1.72	Cement, Cal. ....	1.92

# ACTIVITIES OF THE RAILROAD ADMINISTRATION

Deferred  
Draft  
Classification  
Urged  
for  
Railroad  
Employees



New  
Instructions  
Regarding  
Treatment of  
Ties,  
Improvement  
Work, Etc.

**T**HE GREATEST ACCOMPLISHMENT of the Railroad Administration during the last month has been the completion of the standard form of contract to govern the relations between the railway corporations and the government during the period of federal control. The Director General reviewed the objections raised by representatives of owners of the properties and passed upon them, overruling the objections raised in most cases. The contract which has been completed will form the basis for the individual agreements which will be made with the owners of each railroad covering the use of the property.

Several of the regional directors have called attention to the importance of having all engine terminals in the best possible condition before winter. Necessary repairs to roundhouses, roofs, windows, doors, heating plants, leaky pipes, lighting systems, etc., must be taken care of before November 1 in the territory north of Arkansas and Oklahoma and by December 1 in areas south of those states. Attention has also been called to the fact that the shortage of labor will make necessary more than the usual amount of provision for the shelter of employees working about cinder pits, turntables and coal houses if adequate forces are to be retained during cold and stormy weather this winter.

The Division of Operation has issued a circular prescribing certain rules to be followed in submitting new devices to the Railroad Administration for investigation. These instructions specify the character and size of drawings and the information which should be submitted. Correspondence regarding engineering and maintenance of way devices should be addressed to United States Railroad Administration, C. A. Morse, assistant director, division of operation, engineering and maintenance, Washington, D. C. Nothing in these instructions is intended to prohibit any railroad from testing and developing devices invented by its employees or testing other devices which, in the opinion of the officers of the railroad, have sufficient merit to warrant it.

R. H. Aishton, director of the Northwestern region, has called the attention of the roads in that area to the practice of salvaging the hides of animals killed on the right-of-way, and asking that this practice to be pursued wherever possible, owing to the shortage of leather.

In questionnaire R. P. C. 21, dated September 13, the Northwestern regional purchasing committee suggests that railroads consider the use of rerolled rails and points out that the American McKenna Process Company has a capacity of approximately 15,000 tons per month. Railroads are asked to report the extent to which they

will use rerolled rails as a substitute for new rail, the amount of rail available for rerolling, etc.

In order to determine what additions and betterments and what new extensions should be made in 1919, R. S. Lovett, director of the division of capital expenditures, has instructed in D. C. E. Circular No. 10, dated August 23, 1918, that the federal managers should at once have prepared budgets listing those projects which should be undertaken. Each item involving expenditures chargeable to capital account in excess of \$1,000 should be shown separately.

The Central Advisory Purchasing Committee is now devoting considerable attention to the steel situation. Inasmuch as it was decided not to place additional rail orders for the present because of the shortage of steel, and because a large number of roads had not yet received delivery on their old orders, careful study has been given to the distribution of the rails that are being rolled. Deliveries are now being made at the rate of approximately 40,000 tons a week, and the committee has established a rolling preference by which the mills give priority to the orders for roads on which the requirements are most imperative.

The Purchasing Committee of the Northwestern region has issued Questionnaire No. 27 inquiring as to the details of contracts between the roads and firms or individuals for the inspection of rails, cement, structural steel, etc. Instructions are also included providing that no new contracts shall be entered into without the consent of the committee.

On another page of this issue are given details of circulars granting increased compensation to maintenance employees and officers, including an advance in pay for roadmasters, effective July 1, 1918. In a more recent circular this date has been changed to June 1, 1918.

## TREATING CROSS TIES

The Central Advisory Purchasing Committee has outlined the following program for the treatment of ties for the purpose of preventing interference by commercial treating plants with the program of the Railroad Administration in securing its supply of ties:

1. No arrangement should be made with any commercial tie treating plant both to furnish and treat the ties. Contracts should cover only the treatment of ties to be furnished by the railroad from its regular source of supply.

2. In order that the railroads may avail themselves of an immediate source of possible supply and to prevent possible financial loss to those commercial treating plants which have already purchased cross ties for treatment and re-sale, your committee may purchase from any commercial tie treating plant in your region, all the ties which they may now have on hand at



their plant, either treated or ready for treatment, or any ties which may be at this time on route to their plants as a result of previous purchase by them, and distribute them to the roads most in need of them. In buying such ties you should obtain exact information as to the quantity of ties which may be available for delivery by the treating plant under the conditions stated, and should not make any purchase in excess of that quantity.

3. The Forest Products Section of this committee is compiling the information necessary to formulate a definite plan for making use of the capacity of facilities of all commercial tie and lumber treating plants and for distributing the available supply of railroad ties and timber among the different plants to the best advantage, for the above purpose, thereby preventing confusion and interference of action between the railroads and the treating plants.

4. This applies to all switch ties and cross ties, either hewn or sawn.

Supplement No. 6 to Circular No. 19, issued by the Northwestern region, provides that the prices for ties as included under that circular will remain in effect until July 1, 1919.

#### STEEL NOT AVAILABLE FOR WATER TANKS

B. L. Winchell, regional director of the Southern region, issued circular letter No. 396 on September 16, quoting a letter received from the Priorities Committee of the War Industries Board, advising that applications from contractors for priority on steel intended for the construction of water tanks has been declined and that "it is to be regretted that the railroad companies, generally, have not yet realized the shortage of steel." The letter states that manufacturing concerns are being required to use wood or concrete not only for water, but also for the storage of fuel oil. In view of the continued shortage of steel, the regional director states that all the roads in this territory should understand that applications will not be approved by the priorities committee for the construction of steel water and oil tanks, and that the construction of such tanks must be confined for the present to wood and concrete.

The director of the Northwestern region has issued a circular requiring that certain information relative to concrete water tanks be furnished by September 30, which would indicate the feasibility of building concrete tanks in place of steel.

#### AGREEMENTS COVERING SIDE TRACKS, PIPE CROSSINGS, ETC.

The Eastern regional director states that inquiry was recently made to the director general's office as to whether the managers under the United States Railroad Administration should execute, in their own name, side track agreements, leases for land, permits for crossings for pipes, conduits, overhead crossings for wires, etc., in which it was contemplated to use the regular forms heretofore used by the corporation, and stamp them "United States Railroad Administration," etc., and subject to the usual 30, 60 or 90 days' termination.

In view of the fact that many, if not all, of these permits, notwithstanding their short termination, create conditions which may continue indefinitely, it is thought that the managers should prepare the agreements on the usual forms of the corporation, indicate the approval of the manager by his signature at some appropriate place upon the form, and then forward them to the president of the corporation to be executed by himself or such officer as the corporation may designate. Certain documents, of course, which may be of a temporary nature, may be acted upon without troubling the corporation with the details. More specific instructions concerning this and other matters are being formulated by the Administration and will be sent you in due course.

#### SOLICITATION OF LABOR

R. H. Aishton, director of the Northwestern Region, issued Circular No. 24 on August 28 relative to the solicitation of labor as follows:

With the shortage of labor in all departments of the railroad service, and with the prospects that this will become more serious, it is very important that definite and systematic action be taken by all railroad officers, including foremen, in the recruiting of labor. The following line of action in this direction is suggested:

1. That the duty of keeping a record of the labor requirements be placed in the hands of one man or bureau on each railroad and that this be under the immediate supervision of the federal manager or general manager.

2. That the heads of each department be required to report to that officer or bureau at stated periods as to their labor requirements, and the shortage in the various crafts, this report to include a statement as to the action they are taking in the recruiting of labor.

3. A statement of the labor requirements should be sent to every United States employment office on each line.

4. Bulletins to be sent out from time to time showing the requirements for labor on each division, the salaries paid and the point where labor is desired.

5. Have agents post these bulletins where they can be seen by all interested, and solicit the aid of the newspapers in putting before the public the necessities of the railroads in the labor line.

6. In districts where the harvesting has been completed or where there has been a failure of crops, an active solicitation should be made to secure for railroad service the men who have been released from farm work.

7. Reduced building operations generally, and particularly in small towns, should make available carpenters and laborers for car repair work, if energetically solicited.

Various methods and plans will occur to you for carrying on this work, and we would like reports occasionally of the success you may have with this or any other method you adopt for adding to the labor supply. On some divisions of certain lines, and on some entire railroads, where this method has been followed, it has added greatly to the labor supply.

All officers, foremen, and others employing labor must understand that it is their distinct duty to leave nothing undone in their power to keep the labor supply up to full requirements.

In supplement No. 1 to this circular a further statement is made that it is desired to utilize to the fullest extent possible the United States employment service in providing railroad labor, but it must be understood that no arrangements have been made by the Railroad Administration to the effect that the United States employment service is charged with the duty and responsibility of protecting railroad requirements. The responsibility for maintaining adequate and proper forces on the railroads devolves upon those in charge of the operation of the railroads.

#### IMPROVEMENTS FOR 1919

The Director of the Division of Capital Expenditures has written the following letter to the regional directors:

There are now in course of preparation and printing, which will be issued in a few days, forms with circular of instructions covering the preparation by carriers of the 1919 budget for improvements. In general, the ordering of material may probably await the preparation of the budget, but I am particularly anxious that there should be no delay on this account, and, therefore, wherever in your judgment it is necessary to place orders for structural steel for bridges, turntables, coaling stations, and also machinery and tools for shops and terminals, and other materials for essential facilities for 1919 delivery, you may have the orders placed at any time without awaiting specific approval.

It is not intended that the budget will be formally approved, but it is merely a forecast—rough to some extent—of about what will be the work that will be necessary in 1919, the intention being, of course, that each job will be specifically covered by requisitions on Forms 3, 4 and 6, before the work is actually commenced.

The purpose of this letter is to make it plain that, on account of the great shortage of material and late deliveries, essential work contemplated in 1919 should not be delayed by failure to order the material at this time in cases where it may seem to be necessary.

## DEFERRED CLASSIFICATION FOR RAILROAD EMPLOYEES

The following instructions have been issued by the regional directors relative to claims for deferred classification for railroad employees:

The following instructions will govern respecting employees for which deferred classification should be requested:

(1) The railroad under government control is an essential industrial agency. It is necessary employees should be given deferred classification. It is desired that the federal managers give this matter their active personal attention to make sure that deferred classification is properly claimed for employees that are necessary, and also that no such claim is made where it can reasonably be avoided, since the making of unnecessary claims is both unfair to the government in its work of creating the necessary military and naval forces and injurious to the railroad administration in its effort to secure deferred classification for employees who are really necessary.

(2) Generally speaking, all skilled employees engaged directly or indirectly in the movement of trains should be regarded as necessary employees, and deferred classification should be sought for them accordingly. The following employees are regarded as being in this class: General officers, master mechanics, roundhouse and shop foremen, machinists, blacksmiths, boiler-makers, tin and copper smiths, pipe-fitters, electricians, freight car and passenger car repairmen and inspectors, respective helpers and apprentices of all the foregoing. Chemists, locomotive inspectors, gang leaders, superintendents and assistant superintendents, train masters and assistant train masters, train dispatchers and directors, yard masters and assistants, road foremen of engines and assistants, traveling engineers, foremen instructors, locomotive engineers and motormen, locomotive firemen and helpers, conductors, brakemen and flagmen, train baggagemen and express messengers, yard foremen and helpers, hostlers, enginehouse men, telegraphers and telephoners, block operators, telegraph clerks, engineers of maintenance of way, division engineers, roadmasters, field engineers, supervisors, construction foremen, foremen on track work (generally known as section foremen), bridge, building and water service foremen, bridge, building, ship and wharf carpenters, signal maintainers, telegraph and telephone maintainers.

(3) As to employees not in the foregoing list, you should exercise the greatest care and discretion to aid in obtaining deferred classification for those clearly necessary, while refraining from taking this step in other classes. Where a given position can be reasonably filled by promotion or by the employment of an outside male or female, no effort to secure deferred classification should be made. The mere question of inconvenience or increased expense is not sufficient for regarding an employee as necessary. But where, on account of the character of the work or the complete lack of availability of another to do the work, the existing incumbent is really necessary, you should take all practicable steps to secure deferred classification.

(4) In every case where deferred classification is sought, you should make it clear to the incumbent that it is his duty to the railroad administration to claim deferred classification, so that the incumbent will feel no hesitancy about making this claim. If the incumbent does not make the claim, you, or the appropriate superior of the incumbent in question, should himself make the claim on behalf of the United States Railroad Administration. Steps should be taken to secure the most effective presentation of the matter to the local board and then to the district board, and the Law Department of the particular railroad should be called on to assist where such assistance appears to promise good results.

(5) As soon as regulations are issued, will send additional and more specific advice as to detailed procedure to be adopted. Meanwhile, it is important that you and your officers familiarize yourselves with the general principles by which you will be governed.

## PROGRESS ON IMPROVEMENT WORK

In a statement dated September 12, the United States Railroad Administration announces that the improvement work, other than for equipment specifically authorized to September 10, 1918, aggregated \$545,925,014, of which \$108,602,382 was chargeable to operating expenses and \$437,322,632 to capital account. Of these amounts \$22,634,287 chargeable to operating expenses and \$125,875,656 chargeable to capital account had been expended to July 1, 1918, a total of \$148,509,943, or 27.2 per cent,

of the amount authorized for additions and betterments, excluding equipment.

## ASSIGNMENT OF BALLAST CARS

B. F. Bush, regional director of the Southwestern Region, issued Circular No. 97 on September 20, asking that the federal managers ascertain the number of ballast cars which will be released from maintenance or construction work this fall and that these cars be assigned promptly to other service, such as the handling of cinders, stone, gravel, sand, both company and commercial, thereby releasing coal cars now carrying this traffic. Owning lines should retain control of these cars, so that they will be available in time for shopping, preliminary to their assignment next spring. For this reason it is not considered proper to place them in general service where they may become badly scattered.

## EVERY ISSUE A "WIN THE WAR" NUMBER

UNTIL the termination of the Great Conflict this and every succeeding issue of the *Railway Maintenance Engineer* will be a "WIN THE WAR" number. Our endeavor is to present that information which will contribute most to the proper maintenance of the tracks and structures on our home lines of communication under the present trying conditions, and to the building up of a morale which will cause every man in railway service to exert his maximum effort to defeat the Hun.

In this issue we call attention to the report of the Roadmasters' Convention or "War Council of Track Men," and particularly to the reports and discussions on the conservation of track materials (every spike saved means more shrapnel); on the labor problem and on other questions of track maintenance directly related to the winning of the war.

Another problem of vital importance at present is that of the conservation of fuel. The article on page 333 entitled, "Water Waste and Fuel Conservation," describes one way in which over two million tons of coal can be saved with benefit to all concerned.

The Priorities Committee of the War Industries Board stated recently that the railroads "have not yet realized the shortage of steel" and urged the more extended use of concrete for the construction of water tanks. On page 331 of this issue we describe the concrete water tanks which the St. Louis-San Francisco has built at several points on its line. This article is of special interest in view of the recommendation of the Priorities Board.

Railway men can contribute no more effective assistance to our country in winning this war than by conserving steel and thereby allowing a larger proportion of the output to be converted into munitions. Beginning with the next issue, the *Railway Maintenance Engineer* will describe what is being done on the leading roads of this country to extend the use of rails, track fastenings and other iron and steel products; in this way making available for all the experience of those roads which have given this subject the most attention.

"TRAVELING CONDITIONS IN FRANCE," says a Paris correspondent of the Westminster Gazette, "is not only a matter of high fares, infrequent trains, overcrowded cars, slow journeys, but it is also a question of papers." It is extremely difficult for civilians to travel, and the passenger has to put up with far more inconvenience, delay and overcrowding in the course of his journey than is the case in England, owing to the extent to which the railways and rolling stock are utilized for military requirements and other urgent transportation.



## GENERAL NEWS DEPARTMENT

**Director General McAdoo** has issued an order prohibiting the garnisheeing of wages of railroad employees.

**Pennsylvania Railroad employees** now on active duty in the military or naval service of the United States number 20,193; 14,085 of whom are from the lines east of Pittsburgh and 6,108 from the western lines. In last March the total was 11,769.

**The Chicago, Indianapolis & Louisville** has issued a special routing tariff designed to assist agents in selecting the shortest route between stations on that road. Owing to the peculiar arrangement of the main line and branches of this road, there are many cases where the shortest route between stations is over some foreign road and the attention of the agent is specially directed to this fact.

**Theodore H. Price**, actuary of the United States Railroad Administration, has issued a statement enlarging upon Director General McAdoo's appeal for the public to forego all unnecessary traveling. In this he points out that war conditions necessitate the curtailment of passenger service and that this has caused the crowding of passenger trains, a condition that is experienced to an even greater degree in England. In view of this, it has become a patriotic duty to "Stay at home unless travel is unavoidable."

**Studies are being made** by the United States Railroad Administration to determine whether the adoption of an equitable and universal plan for the compensation of employees, in case of death or injury, and provision of life, health and old age insurance is practicable. There are difficulties in the way arising from the existence of the present pension and insurance plans, but it is expected that they can be overcome.

**At a meeting** of the officers of the Louisiana division of the Illinois Central, held recently to discuss safety measures, the subject of accidents resulting from the use of defective or worn-out tools was presented for consideration and it was recommended that a committee consisting of the claim agent, the traveling engineer and the supervisor make a quarterly inspection of the roadway tools used on each operating district, reporting all defective tools found in use immediately to the superintendent or roadmaster. Such a committee has already been organized on this division.

**The South Carolina Supreme Court** held in a recent case where a railroad built a track to a plant at the request of the owner and according to his desires, but under objection by the railroad that no drainage could be provided for, that the railroad was not liable when surface water flooded the plant. The principle that no one may accumulate storm water on his land so as to throw it on his neighbor in concentrated form and force, to the neighbor's injury, cannot be successfully invoked by one who contracts with his neighbor to do something from which injury results to him as an incidental, if not necessary, consequence of the act.

**The Interstate Commerce Commission** statistics for the first six months of 1918 show that the operating expenses of the railroads amounted to \$1,815,706,527 in 1918, as compared to \$1,354,011,709 for the corresponding period in 1917. The increase in operating revenues was smaller, so that the net income for the first six months of 1918 was only \$151,657,111, as against \$440,050,413 in the first six months of last year. Expenses for maintenance of way and structures have increased as indicated by the fact that \$287,199,132 was spent for this purpose in the first six months of this year as compared to \$218,566,803 for the first six months of last year, or an increase of 31.4 per cent.

**The Great Northern** brought action against the state of Washington for damages to the plaintiff's track resulting from the construction of a state highway. In blasting out a shelf for the highway, slides were caused, which obstructed the track, bent rails, damaged ties, poles and wires and de-

layed trains. The Washington Supreme Court held that the railroad was entitled to recover any increased expense incurred in operating its road during the time necessarily consumed in making repairs, such as additional labor and supplies used on account of trains delayed or annulled as a result of the damages to the track.

**A country-wide inventory** of stocks of steel on hand is being made by the War Industries Board in co-operation with the Census Bureau. The present estimated total production of steel in sight is 17,000,000 tons, while the war demands aggregate over 23,000,000 tons, with the demand constantly rising. Chairman Baruch announces that he cannot approve requests for an ounce of steel for domestic uses. The Census Bureau is sending questionnaires to more than 40,000 manufacturers asking complete reports of stock of steel on hand down to the smallest holdings. It is sought to reach every manufacturer who uses steel in any way and in any amount.

**Every patriot must produce cross ties**; or, if he is not a farmer or owner of timber land, he must do what he can to aid in the production of ties by others. This is the gist of a circular which has been issued by F. H. Fechtig, purchasing agent of the Atlantic Coast Line Railroad, which he is circulating in the territory adjacent to his road. The circular contains the specification for ties as approved by the Railroad Administration, and appeals to the farmer, the tie chopper, the section foreman, tie inspectors, station agents and everybody who can influence a farmer, or aid the company in its quest for largely increased quantities of ties.

**The Interstate Commerce Commission** has issued a report on the valuation of the Texas Midland, in which it found the original cost to date of the property to be \$2,892,360.94 and the cost of reproduction new \$3,461,356 and the cost of reproduction less depreciation \$2,597,442. This is the first decision on the valuation of any road rendered by the commission. The decision of the commission with respect to various disputed points may be summarized in general as follows, although some of the statements are subject to qualifications: Topographic conditions in cost of reproduction are to be those of the present; industry tracks are included only if paid for by the railroad or if the latter has the right to remove them; assessments for public improvements are not included; practically no allowance was made for contingencies; the allowance for engineering was made from 2 to 5 per cent, for general expenses 1½ per cent and the cost of obtaining money 6 per cent. Conclusions as to the construction period, depreciation, lands, etc., confirm the contentions of the Division of Valuation.

**The Massachusetts Supreme Court** held in an action by the driver of an automobile for personal injuries received when he collided with a freight train standing on a crossing where the only negligence relied on was the failure of the automatic electric crossing gong to ring, that even if this appliance were maintained by the railroad because required to do so by statute, its purpose was to protect travelers on the highway from the danger of approaching trains, and not to warn them against cars and engines which were standing still. A plaintiff cannot recover for the violation of a statute unless there is a causal connection between his injury and the condition to which the statute applies. The fact that the railroad voluntarily maintained the appliance without an order or request from the railroad commissioners did not show that it was intended to protect against standing cars. A failure to use a safety appliance, adopted as a protection against some particular danger, cannot be relied upon to prove negligence when the injury is caused by another danger which the appliance was not designed to guard against; and the responsibility voluntarily assumed to maintain these signals imposes no higher duty on a railroad company than the statute requires.



## PERSONAL MENTION

### CORPORATE

**R. Montfort**, consulting engineer of the Louisville & Nashville, has been appointed chief engineer for the corporation, with headquarters at Louisville, Ky.

**D. J. Kerr**, office engineer of the Great Northern, with headquarters in St. Paul, Minn., has been appointed corporate engineer for the Great Northern.

**Albert W. Newton** has been appointed corporate chief engineer of the Chicago, Burlington & Quincy, with headquarters at Chicago. A photograph and sketch of Mr. Newton's career appeared in the *Railway Maintenance Engineer* in February, 1917, page 63, at the time that he was promoted to chief engineer, this being the position he occupied at the time of his recent appointment.

**Edward H. Lee**, who was elected president of the Chicago & Western Indiana and the Belt Railway of Chicago is an engineer by training and experience. He was



EDWARD H. LEE

born at Dayton, Ohio. He attended the Ohio University from 1877 to 1879, and the University of Wooster, 1883 and 1884. He began railway work in 1880 with the Scioto Valley Railway as a rodman and subsequently to 1887 was with various roads as instrumentman, assistant engineer and resident engineer, including the New York, Chicago & St. Louis, the Wisconsin Central and the Union Pacific. He then went to the Elgin, Joliet & Eastern as office engineer, and from 1889 to 1893 was chief engineer of that road. Mr. Lee was engaged in private practice as engineer and superintendent for contractors and in charge of field work for the Sanitary District of Chicago from 1893 to 1898, and since that time has been chief engineer of the Chicago & Western Indiana and the Belt Railway of Chicago, in addition to his duties as vice-president of the same roads. He was elected to the latter position on March 3, 1914, and has now been elected president of these companies, as mentioned above.

**Russell C. Watkins**, who has been appointed corporate maintenance of way engineer of the Southern Pacific Lines in Texas and Louisiana, with headquarters at San Antonio, Tex., was born in Lowndes County, Alabama, on September 18, 1874. In 1895, following his graduation from college, he entered the service of the Southern Pacific Lines as a track student on the Devils River section between San Antonio and El Paso, where he remained until March 1, 1896, when he was transferred to Houston, Tex., working as a track student and assistant foreman. On October 1, 1896, he was given leave to take a position as chief engineer of the Juarez Construction Company in Mexico. Mr. Watkins returned to the Southern Pacific lines as engineer in charge of grade raising through the Rio Grande Valley east of El Paso in the fall of 1897. Following the completion of this work in 1898 he worked with maintenance and locating parties on the Texas lines until transferred to Louisiana. While there he was consecutively assistant engineer of maintenance and construction, office engineer, and temporarily division engineer at San Antonio. Early in 1905 he was appointed right-of-way agent of the lines in Texas and Louisiana and on June

1, 1913, he was promoted to division superintendent on the Houston Division, with headquarters at San Antonio, which position he held until his appointment as noted above.

**Joseph Walter Fox**, valuation engineer of the Central of Georgia, whose appointment as corporate chief engineer of that road has already been announced in these columns, was



JOSEPH WALTER FOX

born at Millville, N. J., on June 8, 1889. He was educated at Purdue University, graduating with the class of 1911. From 1906 to 1911 he was employed in the engineering department of the Pennsylvania Railroad except for the time spent in college. Since graduation he has been employed continuously in the engineering department of the Central of Georgia, serving successively as draftsman, secretary to the chief engineer, assistant engineer, and office engineer in the valuation department. On December 1, 1915, he was promoted to valuation engineer, a position he held until his recent appointment as corporate chief engineer.

### ADMINISTRATION APPOINTMENTS

**Hugh M. Tremaine**, whose appointment as assistant engineer in the capital expenditures division of the Northwestern region of the United States Railroad Administration, with headquarters at St. Paul, Minn., was announced in the September issue, was born at Tama City, Iowa, on August 28, 1883. He attended Iowa State College of Engineering and entered railway service with the Chicago Great Western in Iowa. In 1906 he went to the Northern Pacific as a transitman and served successively as locating engineer, resident engineer on construction and assistant engineer on double track work. For the past two years he was engaged in valuation work.

**H. R. Safford**, chief engineer of the Grand Trunk, with office at Montreal, Que., has been appointed engineering assistant to the director of the Central Western region, United



H. R. SAFFORD

States Railroad Administration, with headquarters at Chicago. Mr. Safford was born at Madison, Ind., and graduated from Purdue University in 1895, entering railway service the same year as a rodman with the Illinois Central. In 1897 he was made resident engineer in charge of construction and in 1900 was appointed roadmaster. He held this position until May, 1903, when he became principal assistant engineer. From 1905 to 1906 he was assistant chief engineer, being promoted in the latter year to chief engineer maintenance of way. He remained in this position until May, 1910, when he left railroad service to become assistant to the president of the Edgar Allen American Manganese Steel Company. He resigned this position in October, 1911, to become chief engineer of the Grand Trunk, a position he occupied until the present time.

**Charles F. Womeldorf**, whose appointment as assistant engineer in the capital expenditures division of the Northwestern region, with headquarters at Chicago, was announced in the September issue of the *Railway Maintenance Engineer*, was born at Fayette, Iowa, on April 18, 1869. He attended Chicago University and Washington University of St. Louis, Mo., and first entered railway service in June, 1886, with the Chicago & North Western. In 1899, he became assistant engineer of maintenance and held this position until 1906, when he was made resident engineer. In 1909 he left railway service to go with the Griffin Wheel Company, Chicago, but returned to the Chicago & North Western in 1915 as resident engineer and remained a year, when he again left railway service to go with the Wisconsin Bridge & Iron Company. The next year he returned to the Chicago & North Western and in May, 1918, left to become general superintendent in the quartermaster department, United States Army, where he was engaged in the construction of the Denver General Hospital, Denver, Colo.

**T. G. Hastie**, whose appointment as assistant engineer in the capital expenditures division of the Northwestern region, with office at Spokane, was announced in the September issue of the *Railway Maintenance Engineer*, was born at Oak Harbor, Wash., on May 18, 1869. After three years at the University of Washington he entered railway service with the Seattle & Montana as a section laborer in January, 1895. In May of the same year he was placed in charge of an extra gang and in July of that same year left railway service to take up general engineering work, resuming permanent railway employment on June 23, 1901, when he entered service with the Great Northern as an axeman on construction work. On September 5, 1901, he was promoted to rodman and in January, 1903, to office clerk on construction work. The same year he became level man and still later in the year he was made assistant engineer. From that time until his recent appointment he served as assistant engineer on construction and maintenance of way work at various places, being in charge of maintenance and construction work, with headquarters at Spokane, Wash., when he received the government position.



T. G. HASTIE

### GENERAL

**C. E. Brinser**, division engineer on the Pennsylvania Railroad, with headquarters at Philadelphia, Pa., has been promoted to assistant superintendent of the New York division with headquarters at Trenton, N. J.

**H. H. Russell**, whose promotion from division engineer to assistant division superintendent on the Pennsylvania Railroad, with headquarters at Pittsburgh, Pa., was noted in the December, 1917, issue of the *Railway Maintenance Engineer*, has been promoted to superintendent of the Williamsport division, with office at Williamsport, Pa.

**Martin W. Clement**, who has been appointed as superintendent of freight transportation of the Pennsylvania Railroad, eastern lines, with headquarters at Philadelphia, Pa., entered the service of the Pennsylvania Railroad on August 1, 1901, as a rodman. In 1916 he was appointed division engineer, under the principal assistant engineer of the New Jersey division, and in June, 1917, he was appointed superintendent of the New York, Philadelphia & Norfolk. He was promoted to superintendent of freight transportation of the Pennsylvania Railroad on September 1, as noted above.

### ENGINEERING

**O. H. Gersbach**, engineer maintenance of way of the Indiana Harbor Belt, with headquarters at Gibson, Ind., has been appointed chief engineer.

**F. W. Bailey**, superintendent maintenance of way of the San Antonio & Aransas Pass, has been appointed assistant engineer maintenance of way at Yoakum, Tex.

**E. R. Breaker**, chief engineer of the San Antonio, Uvalde & Gulf, has been appointed assistant mechanical superintendent, with headquarters at North Pleasanton, Tex.

**A. Montzheimer**, chief engineer of the Elgin, Joliet & Eastern, with headquarters at Joliet, Ill., has had his authority extended over the Chicago, Milwaukee & Gary, succeeding **I. W. Troxel**.

**J. M. Weir**, chief engineer of the Kansas City Southern, with headquarters at Kansas City, Mo., has had his authority extended over the Kansas City, Mexico & Orient, with the same headquarters.

**W. A. Clark**, chief engineer of the Duluth & Iron Range, has had his authority extended to include the Duluth, Missabe & Northern, succeeding **H. L. Dresser**, with headquarters at Duluth, Minn.

**C. R. Morrill**, assistant general manager of the Southern Pacific, Texas Lines, has been appointed engineer maintenance of way of all lines under **W. B. Scott**, federal manager, with headquarters at Houston, Tex.

**T. J. Wyche**, chief engineer and chairman of the Valuation Committee of the Western Pacific at San Francisco, Cal., has been appointed chief engineer of the Western Pacific, the Tidewater Southern and the Deep Creek railroads.

**A. R. Cook**, principal assistant engineer of the Northern Pacific, with headquarters at Tacoma, Wash., has been appointed engineer maintenance of way for the lines west of Paradise, Mont., succeeding **L. M. Perkins**, transferred.

**J. L. Starkie**, office engineer on the Gulf, Colorado & Santa Fe, with headquarters at Galveston, Texas, has been appointed assistant engineer on the roads operated under the supervision of **J. S. Pyeatt**, federal manager, and **J. H. Davidson** has been appointed water engineer, with headquarters at Dallas.

**S. Murray**, chief engineer of the Oregon-Washington Railroad & Navigation lines, has been appointed chief engineer also of the Southern Pacific Lines north of Ashland, Ore., the Pacific Coast and the Northern Pacific Terminal of Oregon, with headquarters at Portland, Ore., effective September 12.

**R. E. Chamberlain**, division engineer of the Baltimore & Ohio, western lines, with office at Flora, Ill., has been transferred to Chillicothe, Ohio, succeeding **A. H. Freygang**, promoted. **John Hewes, Jr.**, has been appointed division engineer with headquarters at Flora, Ill., succeeding Mr. Chamberlain.

**J. M. Silliman**, resident engineer of the Canadian Pacific, with headquarters at London, Ont., has been appointed division engineer in charge of maintenance of way forces on the Susquehanna division of the Delaware & Hudson, with office at Oneonta, N. Y., succeeding **H. S. Rogers**, who has resigned.

**George H. Davis**, resident engineer of the Toronto Terminals of the Canadian Pacific, has been appointed assistant engineer maintenance of way, with office at Montreal, Que., and **U. A. G. Dey**, assistant engineer of construction at Montreal, has been made assistant engineer of the Toronto Terminals, succeeding Mr. Davis.

**William Travers**, acting assistant division engineer of the Utah division of the Oregon Short Line, with headquarters at Pocatello, Idaho, has been promoted to division engineer with the same headquarters, succeeding **R. B. Reasoner**, who has entered military service as a first lieutenant in the Engineer Officers Reserve Corps. **H. H. Holmberg** succeeds Mr. Travers as acting assistant division engineer.

**E. G. Lane**, engineer maintenance of way on the Baltimore & Ohio, western lines, with office at Cincinnati, O., has been promoted to chief engineer, succeeding **L. G. Curtis**, who has accepted service with the corporation. Mr. Lane's authority includes also the Dayton & Union Railroad and the Dayton Union Railroad. **H. R. Gibson**, district engineer maintenance of way at Cincinnati, succeeds Mr. Lane.

**Maurice Coburn**, principal assistant engineer on the Pennsylvania Line West, St. Louis System, with office at St. Louis, Mo., has been appointed supervising engineer on the St. Louis System, with headquarters at Indianapolis, Ind. The headquarters of the St. Louis system of the Pennsylvania have been moved to Indianapolis, and the Indianapolis Terminal and the Louisville divisions have been added to this system.

**Correction.**—In the notice of the appointment of Earl Stimson as general superintendent of maintenance of way and structures of all lines under the jurisdiction of A. W. Thompson, federal manager at Baltimore, Mo., the statement was made that Mr. Stimson graduated from Cornell University in 1895. This statement was incorrect to the extent that while Mr. Stimson attended this university from 1893 to 1895, he did not graduate from it.

**W. G. Massenburg**, division engineer on the Gulf, Colorado & Santa Fe, at Beaumont, Texas, has been appointed district engineer of that road and the Ft. Worth & Rio Grande, the St. Louis-San Francisco & Texas, the Brownwood North & South, the Texas Midland, the International & Great Northern from Spring to Ft. Worth and Madisonville branch, the Ft. Worth Belt and the Ft. Worth Passenger Station, with headquarters at Galveston, Tex.

**W. H. Kirkbride**, assistant superintendent of the Sacramento division of the Southern Pacific, Pacific System, with headquarters at Sacramento, Cal., has been appointed chief engineer of the Southern Pacific-Pacific System lines, south of Ashland, Ore., with office at San Francisco, succeeding **W. Hood**, who was retained by the corporation. A sketch of Mr. Kirkbride's career appeared in the January, 1918, issue of the *Railway Maintenance Engineer*, page 30.

**John Muir Sills**, district engineer on the St. Louis-San Francisco, with headquarters at Springfield, Mo., has been promoted to assistant chief engineer with office at St. Louis, Mo. Mr. Sills was born in Kansas City, Mo., on January 28, 1881, and after graduating from Kansas University in 1903, entered railway service the same year with the St. Louis-San Francisco as a rodman on location work. He was employed subsequently both on location and maintenance as transitman, assistant engineer, resident engineer and district engineer, in addition to two years on city engineering work at Kansas City, Mo., and several months with the Metropolitan Street Railway Company of that place.

**D. E. Gelwix**, office engineer on the St. Louis-San Francisco, with headquarters at Springfield, Mo., has been promoted to district engineer with the same headquarters. He was born at Thayer, Kan., on February 14, 1887, and graduated from the University of Kansas. In September, 1912, he entered railway service with the St. Louis-San Francisco, as assistant engineer in the office of the district engineer. He remained there for four years, going to the Kansas City, Clinton & Springfield as valuation engineer in June, 1916. He returned to the Frisco in September, 1917, as assistant engineer in the office of the district engineer, which position he held until December of that year, when he was promoted to office engineer in the chief engineer's office. It was this position he held when appointed district engineer, as noted above.

**Victor Albert George Dey**, assistant engineer, construction department of the Canadian Pacific at Montreal, Que., has been appointed resident engineer of the Toronto Terminals division at Toronto. Mr. Dey was born in Aberdeen, Scotland, on February 4, 1883, and was educated in St. Andrew's Episcopal Church School, Robert Gordon's College and Gray's School of Art in Aberdeen. From 1897 to 1902 he served an apprenticeship as architect and surveyor with

Brown & Watt, architects and valuers, Aberdeen. During 1902 and until June, 1903, he served as assistant with the same firm. He began railway work in this country in September, 1903, as draftsman in the office of the chief engineer of the Canadian Pacific at Montreal. From June, 1907, to June, 1911, he was office engineer in the chief engineer's office of the Quebec, Montreal & Southern at Montreal. In June, 1911, he returned to the Canadian Pacific as assistant engineer in the construction department, which position he held until receiving his appointment as resident engineer, as noted above.

**T. T. Irving**, who has been appointed chief engineer of the Grand Trunk, Western Lines, with headquarters at Detroit, Mich., was educated at the Prince of Wales College and

McGill University, graduating from the latter institution in 1898. He entered the service of the Grand Trunk in May of that year as assistant engineer on the Eastern division at Montreal. In 1904 Mr. Irving was promoted to resident engineer on the Western division and was engaged in that capacity until 1912, at which time he was appointed trainmaster. The following year he became division engineer on the Western lines, with headquarters at Chicago, which position he held until his promotion to chief engineer of the Western lines at Detroit, Mich., as mentioned above.



T. T. IRVING

**Robert L. Holmes**, whose appointment as engineer of water service of the Texas & Pacific, with headquarters at Dallas, Texas, was announced in last month's issue, was born at Clinton, La., on September 8, 1880. He entered railway service as a rodman and chainman with the Texas & Pacific in March, 1900, and a year later was instrumentman on construction work. In 1904 and 1905 he worked in the maintenance department and in 1906 he was made assistant engineer on construction, which position he held until 1909, when he became assistant engineer on maintenance. In August, 1911, he was promoted to division engineer on the eastern division, where he remained until August, 1915, when he was made assistant engineer of the system. It was this position he held when promoted to engineer of water supply.

**Arthur Daniels**, who was appointed district engineer of the Chicago, Milwaukee & St. Paul, with headquarters at Minneapolis, Minn., was born at Marion, Iowa, on December 25, 1884. He graduated from the State College of Iowa in 1907, having spent summer vacations during his college course in the service of the Chicago, Milwaukee & St. Paul as a rodman in the engineering department. In September, 1907, he became an instrumentman on this road and served in that capacity until 1910 on miscellaneous work. Mr. Daniels then became assistant engineer in charge of certain bridge construction on the Puget Sound line of the same road and from 1911 to 1913 he served in a similar capacity on the middle district. The following three years he was in charge of track elevation work with headquarters at Milwaukee, being promoted to acting district carpenter in 1917. In the early part of 1918 he became assistant engineer in the valuation department, which position he held until his appointment as noted above.

**Tulla E. Bliss**, whose appointment as district engineer on the St. Louis-San Francisco, lines east of the Mississippi river, with headquarters at Birmingham, Ala., was announced in the September issue of the *Railway Maintenance Engineer*, was born at Oskaloosa, Kan., on April 22, 1884. He graduated from Kansas University in 1909, working at intervals



during his college course as a chainman and rodman with the Atchison, Topeka & Santa Fe. After graduation in 1909, he returned to the Santa Fe as draftsman. In August of the same year he went with the St. Louis-San Francisco as rodman at Springfield, Mo., being advanced to transitman in November. In January, 1914, after a short service as draftsman, he was promoted to assistant engineer in the district engineer's office, which position he held when appointed district engineer, as noted above.

**Frederick E. Morrow**, who was appointed chief engineer of the Chicago & Western Indiana and the Belt Railway Company of Chicago, succeeding **E. H. Lee**, who has been made president of these corporations, graduated from the civil engineering course at Purdue University in 1904. From June to November of that year he was employed in the engineering department of the Illinois Steel Company. From that time until April, 1907, he was in the service of the Chicago & North Western in the consecutive capacities of rodman, instrumentman and assistant engineer. He then took a position as field engineer in the division of track and roadway of the Board of Supervising Engineers, which he held during the rehabilitation of the Chicago surface lines. In April, 1910, he entered the Chicago & Western Indiana organization as office engineer. In March, 1913, he was promoted to principal assistant engineer, and in September, 1915, was appointed assistant chief engineer of both the Chicago & Western Indiana and the Belt Railway, which position he held until his appointment as noted above.



FREDERICK E. MORROW

### TRACK

**A. F. Harlow** has been appointed roadmaster of the Second district of the Third division of the Denver & Rio Grande, with headquarters at Gunnison, Colo., succeeding **John Sweeney**, transferred.

**John Gratten** has been appointed roadmaster with jurisdiction over the second district of the third division of the Denver & Rio Grande, with headquarters at Delta, Colo., succeeding **W. S. Evans**, who has been granted a leave of absence.

**R. N. Milliken**, roadmaster on the Orangeville subdivision of the Canadian Pacific, with headquarters at Orangeville, Ont., has been transferred to the Newport subdivision, with headquarters at Farnham, Que. **J. Cameron** has been made acting roadmaster of the Orangeville subdivision.

**F. J. Parkhurst**, roadmaster on the Indianapolis & Michigan City division of the Lake Erie & Western, with headquarters at Peru, Ind., has been transferred to the Middle division, with office at Tipton, succeeding **A. B. Richards**, who has been assigned to other duties. **J. N. De Myer** has been appointed acting roadmaster at Peru, succeeding Mr. Parkhurst.

**Oscar Olson**, who has been appointed roadmaster on the Iowa & Dakota division of the Chicago, Milwaukee & St. Paul, with headquarters at Sanborn, Iowa, as announced in the September issue of the *Railway Maintenance Engineer*, was born at Necedah, Wis., in 1878. After a common school education, he entered railway service as a section laborer in 1892 with the St. Paul. In 1898 he was made section foreman and three years later was made extra gang foreman. From that time until he was appointed roadmaster, as noted above, he served as extra gang foreman in the summer and section foreman in the winter.

**John Nelson De Myer**, who has been appointed acting roadmaster on the Indianapolis & Michigan City division of the Lake Erie & Western, with headquarters at Peru, Ind.; was born at Stillwell, Ind., on February 10, 1873. In 1895 he entered railway service with the Baltimore & Ohio as a track laborer. He remained with that road until April 1, 1902, when he went with the Lake Erie & Western as a track laborer. On September 1, 1902, he was made section foreman and continued in this position until appointed acting roadmaster, as noted above.

**J. J. Sewart**, acting roadmaster on the Atlantic Coast Line at Petersburg, Va., whose appointment as roadmaster at the same point has already been announced in these columns, has completed 27 years' continuous service in the maintenance department of this road. He began work in 1885 with contractors engaged in railway work and entered the service of the Atlantic Coast Line as a carpenter foreman in 1891, following this work until 1911, when he was put in charge of a pile driver train and the building of trestles and tracks. In December, 1917, he was made assistant roadmaster at Petersburg, which position he held at the time of his recent promotion.

**Norman Frederick Kelsey**, whose appointment as roadmaster on the Chicago, Milwaukee & St. Paul was announced in the September issue of the *Railway Maintenance Engineer*, was born at Waupeton, Iowa, on November 1, 1895. After attending grammar and high school, he entered railway service as a section laborer with the St. Paul on June 1, 1911. He continued in this work a year and a half when he became a helper in the bridge and building department. After six months at this work he became section and yard foreman, which position he retained until June, 1917, when he was made extra gang foreman. On August 28, 1918, he was appointed roadmaster, with headquarters at Farmington, Minn., as noted above.

### BRIDGE

**William Mahan**, acting superintendent of bridges and buildings on the Wheeling & Lake Erie, has been appointed superintendent of bridges and buildings, with headquarters at Brewster, Ohio.

**J. E. Long**, general inspector of bridges and buildings of the Denver & Rio Grande, has been appointed general supervisor of bridges and buildings of the Colorado lines, with headquarters at Denver, Colo.

**K. B. Duncan**, engineer on the Gulf Lines of the Gulf, Colorado & Santa Fe, with headquarters at Galveston, Texas, has been appointed bridge engineer of the roads operated under the supervision of **J. S. Pyeatt**, federal manager, with headquarters at Dallas, Texas.

### PURCHASING

**J. M. Wagner** has been appointed purchasing agent of the Copper Range, with headquarters at Houghton, Mich.

**William McMaster**, purchasing and industrial agent of the Indiana Harbor Belt, at Chicago, has been appointed purchasing agent.

**C. H. Kenzel**, purchasing agent of the Elgin, Joliet & Eastern at Chicago, has been appointed purchasing agent also of the Chicago, Milwaukee & Gary.

**A. E. Wright**, secretary and purchasing agent of the St. Louis & O'Fallon, has been appointed secretary and assistant to the president, with headquarters at St. Louis, Mo.

**W. C. Weldon**, purchasing agent of the Colorado & Southern, has had his jurisdiction extended to include the Denver & Salt Lake, with headquarters at Denver, Colo., succeeding **A. L. Cochrane**.

**L. B. Wood**, purchasing agent and general storekeeper of the Southern Pacific, Texas Lines, has been appointed general storekeeper of all lines under **W. B. Scott**, federal manager, with headquarters at Houston, Tex.

**E. T. Burnett**, until further notice, will perform the duties of purchasing agent of the Norfolk & Western, in addition to his duties as chairman of the Regional Purchasing Committee for the Pocahontas region.

**A. S. McKelligon**, general storekeeper of the Southern Pacific, with headquarters at San Francisco, Cal., has had his jurisdiction extended over the Western Pacific, the Tidewater Southern and the Deep Creek railroads.

**H. C. Robinson** has been appointed purchasing agent of the Chicago Junction and the Chicago River & Indiana, with office at Union Stock Yards, Chicago, succeeding **S. Salter**.

**H. E. Dutton**, purchasing agent of the Green Bay & Western, has been appointed purchasing agent also of the Kewanee, Green Bay & Western, the Ahnapee & Western and the Waupaca-Green Bay, with headquarters at Green Bay, Wis.

**F. W. Taylor**, purchasing agent of the Southern Pacific Company, at San Francisco, Cal., has been appointed purchasing agent of the Southern Pacific system, lines south of Ashland, Ore., the Western Pacific, the Tidewater Southern, and the Deep Creek Railroad.

### IN MILITARY SERVICE

**S. W. Hughes**, roadmaster of the Atlantic Coast Line at Parmele, N. C., has left the service to enter the Engineers Corps of the United States Army.

**Lieutenant-Colonel Lincoln Bush**, formerly chief engineer of the Delaware, Lackawanna & Western, and later consulting bridge engineer, at New York City, has been commissioned colonel in the construction division of the Quartermaster Corps at Washington, D. C.

### OBITUARY

**William R. Trobridge**, supervisor on the Trenton division of the Pennsylvania Railroad, died September 13, 1918, at his home in Bordentown, N. J.

**John Howe Peyton**, president of the Nashville, Chattanooga & St. Louis, at Nashville, Tenn., who died on September 14, from a bullet wound, was an engineer of long experience in the South. Mr. Peyton was born on March 17, 1864, in Howard County, Mo. He was educated at Roanoke College, Salem, W. Va., and began railway work in June, 1881, as a rodman on the Richmond & Louisville. He subsequently served consecutively as a rodman on the Richmond & Danville and an instrument man on the Tennessee & Midland and the Farmerville & Powhatan. In 1885 he was appointed resident engineer of the Lynchburg & Durham; in 1888, he became resident engineer of the Georgia, Carolina & Northern, and from 1889 to 1891 he was assistant to the chief engineer of the Charleston, Clendennin & Sutton at Charleston, W. Va. From 1892 to 1900 he was engaged in varied pursuits, including general engineering and contracting work, and service in the United States Army. From 1900 to 1901 he was resident engineer of the Chesapeake & Ohio, becoming later chief engineer of the Great Eastern. He then served as locating engineer of the Louisville & Nashville until 1903, when he was appointed engineer of construction of the Atlanta, Knoxville & Northern. From 1904 to 1909 he was principal locating engineer of the Louisville & Nashville. In 1909 he was appointed consulting engineer of the North Coast Railroad. The following year he became assistant to the president of the Louisville & Nashville; two years later he was appointed also chief engineer of construction of the same road and on January, 1914, he was made president of the Nashville, Chattanooga & St. Louis.



JOHN HOWE PEYTON

## CONSTRUCTION NEWS

The Chesapeake & Ohio has ordered 803 tons of steel for new shops at Huntington, W. Va., and Richmond, Va., from the Richmond Structural Steel & Iron Works, the Fort Pitt Bridge Works and the Central States Bridge Company.

The Illinois Central has awarded a contract to T. S. Leake & Co., Chicago, and work is now in progress on the construction of a one-story freight house, 38 ft. by 200 ft. with concrete foundation, brick walls and tile roof, at La Salle, Ill. A platform 16 ft. wide will extend 120 ft. beyond the building and will be constructed of concrete and floored with creosoted blocks. In addition, 1,100 sq. yd. of driveway will be paved with brick. The old freight house at this point is being remodeled into a two-stall engine house. The improvements, which include a rearrangement of tracks, which is being done by the railroad, will cost about \$75,000.

This road is also preparing plans for the construction of a one-story brick freight and passenger station at Dawson Springs, Ky. The building will be 34 ft. by 192 ft. with a concrete foundation and a slate roof.

The Pennsylvania Railroad, Western Lines, have commenced the construction of car repair shops at 59th and Leavitt streets, Chicago. The buildings which will be erected will be of brick and reinforced concrete construction and will include a machine shop, a general service and office building, a wood shop, a door shop, a paint shop, a fire station and a supply shed. In addition an ice house and a fan house for a smoke collecting system are being erected on the same property. Charles B. Johnson & Son, Chicago, have the contract for the building construction and incidental track work will be done by railroad forces.

The Philadelphia & Reading is building an engine yard near Essington, Pa., on the Chester branch to be known as the Darby creek engine yard. This will consist of an engine house of brick and concrete, one story in height, 72 ft. 8 in. wide by 211 ft. long and 26 ft. high with a continuous monitor with ventilating sash. Lean-to structures 25 ft. wide and 211 ft. long will be provided to be used for power house, machine shop, store room and office. The engine house will have two longitudinal inspection pits and a wheel jack pit with hoist. The installation will also include a 100-ft. tractor-driven turntable, which will have a reinforced concrete substructure; a concrete storage pit 10 ft. wide, 173 ft. long and 10 ft. deep with a steel trestle track support; a concrete ash water pit 4 ft. wide, 200 ft. long and 5 ft. deep; a concrete inspection pit 4 ft. wide, 76 ft. long and 3 ft. 6 in. deep; two 47,000-gal. wooden tanks on concrete and brick substructures 21 ft. wide, 46 ft. 2 in. long and 26 ft. high; two concrete water column pits 8 ft. 6 in. wide, 16 ft. long and 8 ft. deep; a concrete pump house 14 ft. wide, 19 ft. long and 10 ft. deep with a pump pit, 14 ft. wide by 19 ft. 6 in. long and 32 ft. deep and a concrete intake well of 10 ft. diameter, 27 ft. deep.

The San Diego & Arizona has been completed from San Diego, Cal., east about 95 miles, and from El Centro, on the Southern Pacific, west, about 31 miles, leaving a gap of 10 miles, upon which construction work is now going on. This 10 miles is in the canyon of Carriso Creek, where 17 tunnels are being built, the longest of which is 2,612 ft., the next longest 2,534 ft., and the total length of all the tunnels, 2.6 miles. The road when completed will give San Diego a direct line to the East.

### STRUCTURAL STEEL

The Wabash has ordered four 100-ft. turntables, weighing 369 tons, from the American Bridge Company.

The Denver & Rio Grande has ordered eight truss bridges, weighing 1,050 tons, from the Virginia Bridge & Iron Co.

The Minneapolis, St. Paul & Sault Saint Marie has ordered four 90-ft. standard turntables, weighing 208 tons, from the Milwaukee Bridge Company.

## SUPPLY TRADE NEWS

### GENERAL

The Cutler-Hammer Manufacturing Company, Milwaukee, manufacturers of electric controlling devices and allied apparatus, announces the opening on September 3 of a branch office in the Union Trust Building, 15th and H streets, N. W., Washington, D. C. This office will be in charge of H. W. Knowles and C. W. Yerger.

The Lidgerwood Manufacturing Company has opened an office in the Union National Bank building, Cleveland, Ohio, for the better handling of its line of contractors' hoists, mine hoists and cableway business in that territory. This office will be in charge of Ernest F. Pegg, who has been handling the Lidgerwood line for the former agents, the W. M. Pattison Supply Company.

### PERSONAL

H. W. McCandless, vice-president of the Weir Frog Company, Cincinnati, Ohio, died on August 21.

Harry E. Passmore, formerly with the Grip Nut Company, has gone with the Marble Cliff Quarries Company, Columbus, Ohio, as production manager.

P. H. Hamilton, roadmaster on the St. Louis-San Francisco, with headquarters at Sapulpa, Okla., has resigned to become southern representative of the P. & M. Company, with office at Chicago.

Fred Preston, formerly manager of sales of the P. & M. Company, Chicago, and last fall commissioned a captain in the Signal Corps of the United States Army with the Aircraft Production Board in France, has been promoted to the rank of major.

Marshall E. Keig, secretary and treasurer of Harry Vissering & Co., secretary and treasurer of the Okadee Company, and third vice-president of the Charles R. Long, Jr., Company, with office at Chicago, has resigned from those positions and has been given a leave of absence for the period of the war. Mr. Keig has been accepted for service in the signal corps of the army after having been rejected from the artillery, infantry, marines, railroad regiments and navy on account of defective vision. Before entering the railway supply field, Mr. Keig was employed by the Atchison, Topeka & Santa Fe. From 1904 until 1907 he was in the construction and operating departments and in the ensuing five years was in the general purchasing department at Chicago. He has been with the supply companies which he now leaves ever since severing his connection with the Santa Fe.

J. G. Sullivan, who resigned recently as chief engineer of the Canadian Pacific, Western lines, with headquarters at Winnipeg, Man., has opened a consulting engineer's office in that city, making a specialty of railway work, mining, foundations, tunnelling, elevators, etc.

L. C. Sprague, special railroad sales representative of the Chicago Pneumatic Tool Company, with headquarters at Chicago, has been promoted to district manager of sales for that company, at New York, succeeding Charles Booth, resigned. C. W. Cross succeeds Mr. Sprague.

B. J. McComb, superintendent of construction of the Wheeling & Lake Erie, with headquarters at Canton, Ohio, has resigned to accept a position in the sales department of the Reading Specialties Company, Reading, Pa., and will have charge of the middle western territory, with headquarters at Canton, Ohio.

B. H. Tripp, special representative of the Chicago Pneumatic Tool Company on the Pacific coast, has been appointed district manager of sales for the Pacific coast territory, succeeding M. W. Priseler, with headquarters at San Francisco, Cal. The Los Angeles branch of the company also comes under Mr. Tripp's jurisdiction.

Charles H. Tucker has resigned his connection with the Toledo Bridge & Crane Company of Toledo, Ohio, and together with William F. Billingsley and others has incorporated the American Crane & Engineering Company of that city. It is reported that this company has a government contract for locomotive cranes and will build a plant for their manufacture.

Payne G. West, assistant sales manager of the T. L. Smith Company, concrete machinery manufacturers, Milwaukee, Wis., has severed his connection with that firm to take the

position of assistant manager of field sales for the Lakewood Engineering Company, Cleveland, Ohio. Mr. West received his education in the public schools of Milwaukee, at Carroll College, Waukesha, Wis., and in the College of Engineering, University of Wisconsin. He graduated from Carroll College in the class of 1901. After spending a number of years in various construction projects and different manufacturing lines, he became associated with the T. L. Smith Company in 1907 and was in the continuous service of that company until the time of the change noted above, a

period of twelve years. During most of this time he was assistant general sales manager, a position which afforded him an opportunity to gain a thorough knowledge of the machinery field as well as of factory production methods.

Captain J. J. Gaillard has been made district engineer in charge of the Atlanta office of the Portland Cement Association, succeeding W. Jess Brown, who has resigned to accept a commission as captain in the Ordnance Department of the U. S. Army. Captain Gaillard joined the forces of the Portland Cement Association on January 1, 1918, and since that time has been doing general promotion and inspection work in the district covered by the Atlanta office of the association.



PAYNE G. WEST



MARSHALL E. KEIG

### TRADE PUBLICATIONS

**Pneumatic and Electric Tools.**—The Independent Pneumatic Tool Company, Chicago, has issued a four-page circular describing its pneumatic and electric tools with photographs and dimensions.

**Drag Scrapers.**—The R. H. Beaumont Company, Philadelphia, Pa., has just issued a new catalogue, No. 38, describing and illustrating the Beaumont drag scraper system for the ground storage of coal.

**Scales.**—The Standard Scale and Supply Company, Pittsburgh, Pa., has issued a catalogue of 48 pages, descriptive of its products. Several pages are devoted to the design and construction of railroad track scales and other scales used extensively in railway service. The catalogue is attractively prepared with profuse illustrations and a complete descriptive index. The information contained is presented in a particularly concise manner.



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